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VOLUME XV.
NUMBER 10.

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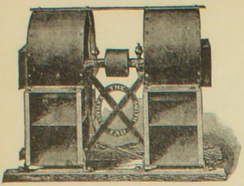

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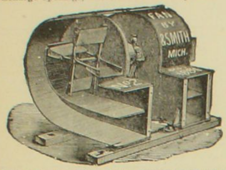

Section showing TWO Patent DISCHARGE CHAMBERS for EACH Fan Wheel, where others have only One.

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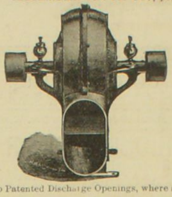
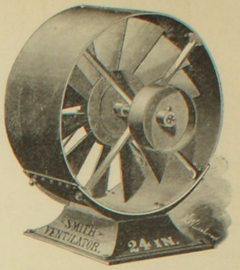


Front View, showing Two Patented Discharge Openings, where all others have only One.



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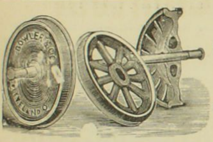
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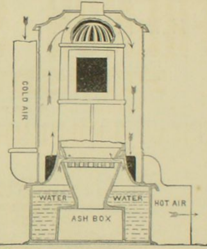

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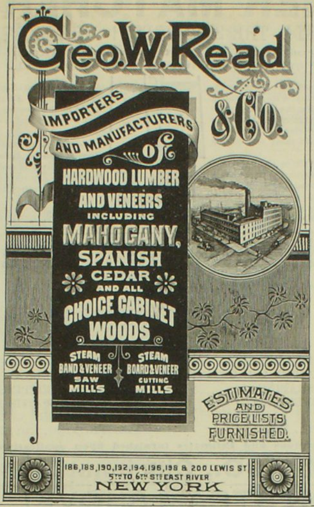

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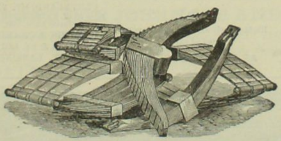

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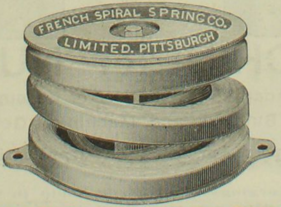

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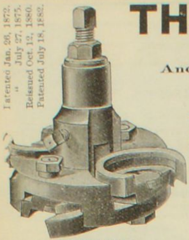

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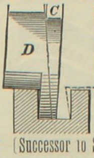

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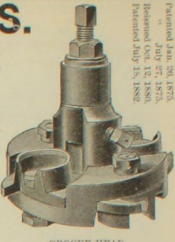

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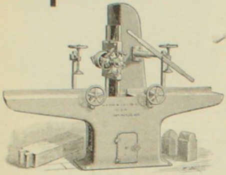

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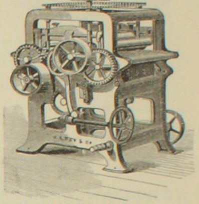

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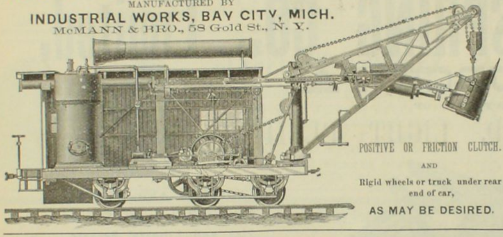

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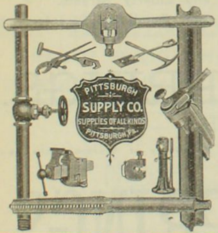
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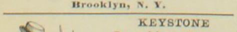

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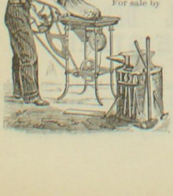

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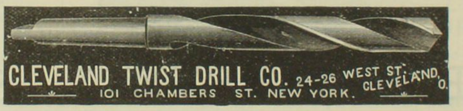

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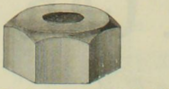

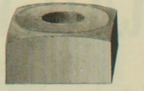

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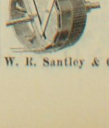

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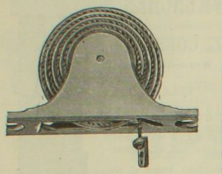

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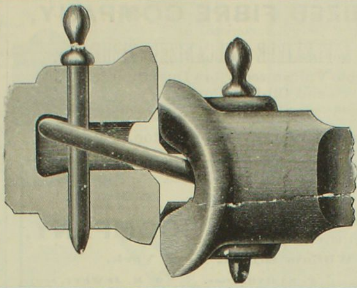

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Victory over more than 30 Self-Couplers in the Master Car-Builder's Convention of June, 1876. Also indorsement for safety in coupling by the Yard Masters, in their Convention, June, 1877, and by 300 others who were unable to attend the Convention, and 300 railroad officials who are resident in 26 States, and who admitted superiority over any other yet produced. Try 30 free of royalty, and see for yourself! Pattern free, and no change in timbers or connections. Those made by Wilson, Walker & Co., Pittsburgh, Pa., *will save* 200 *per cent. in repairs*, and give double life service over *old styles of* wrought iron. About 43,000 in use by 146 railroads. The *saving in repairs* by using *my invention* is from 20 per cent. to 80 per cent. as per *report of many officers.*

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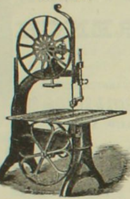

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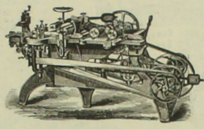

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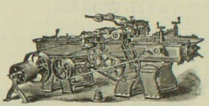

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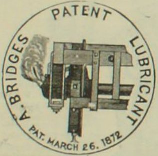

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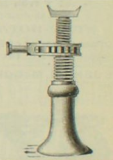

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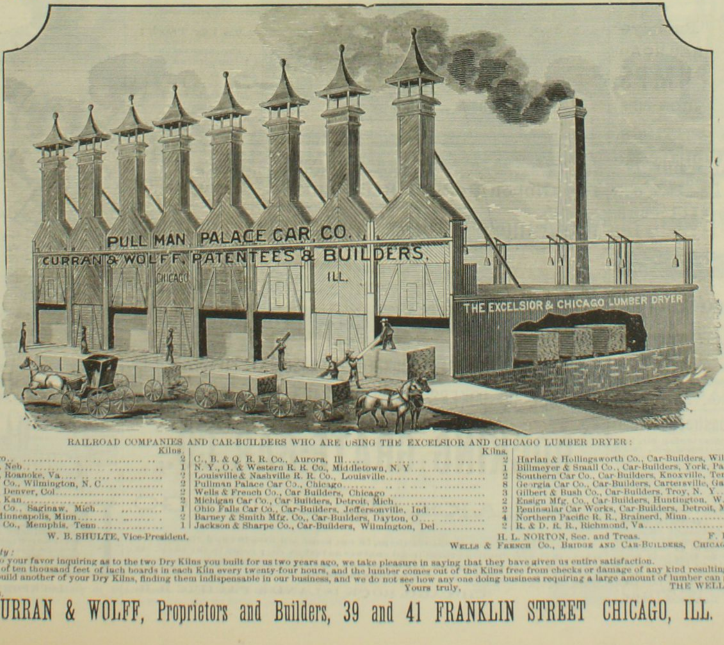
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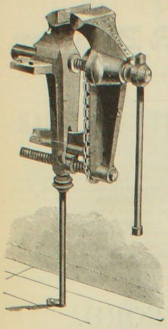

Our NO. 6 VISE opens 10 inches, with 8-inch Jaws; has solid forged screws 1¾-inch diameter, with 26-inch lever. We make 5 smaller sizes of same pattern. Special discounts to R. R. Companies and Car Companies on application.

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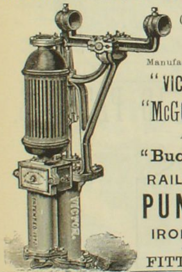

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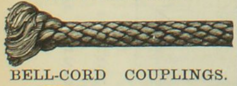

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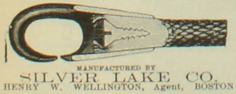

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All the main features, such as leveling car, turn table, self-adjustable step for vertical post, twenty feet hoist, working over embankments, swinging load—car body or more—direct on to freight car, hinged jacks, direct grapples to rail, and other important features, all perfected and patented by Jewett, foreman of a wrecking gang for many years. For further information apply to the builder,

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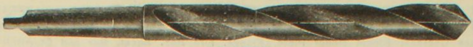

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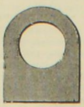

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Flexible Vulcanized Fibre Dust Guards and Oil-Box Covers,

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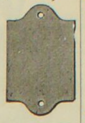

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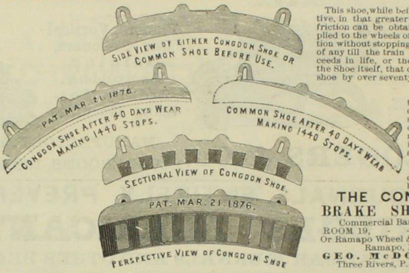
CONGDON'S IMPROVED CAR BRAKE SHOE.


SIDE VIEW OF EITHER CONGDON SHOE OR COMMON SHOE BEFORE USE.
PAT. MAR. 21. 1876.
CONGDON SHOE AFTER 40 DAYS WEAR MAKING 1440 STOPS.
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SECTIONAL VIEW OF CONGDON SHOE.
PAT. MAR. 21. 1876.
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This shoe, while being more effective, in that greater uniformity of friction can be obtained when applied to the wheels of a train in motion without stopping the revolution of any till the train is at rest, exceeds in life, or the durability of the Shoe itself, that of the cast iron shoe by over seventy-five per cent.

Its durability, together with cheapness and simplicity of construction, recommend it in preference to any other in use

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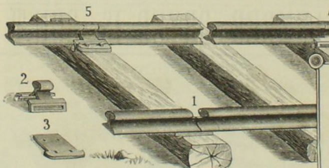

To Lay Track:

First, place the Rails No. 1, then put down No. 2 on No. 1, as shown in No. 4, slide No. 3 into No. 4; spike down, and Joint is complete, as shown in No. 5.

The most perfect rail joint in existence. Combines all the Desirable Features of the Old Chair Joints and Modern Angle Plates, and has none of the Objectionable Features of Either.

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Manganese Bronze and Brass Castings,

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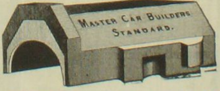
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Are doing all you claim for them, in use some ten months and clean no fires where they are. Putting them in all engines as fast as they come in the shop. We run our engines the long run, 228 miles, and when they get through the fire is as clean as when starting out. Ten months in use.

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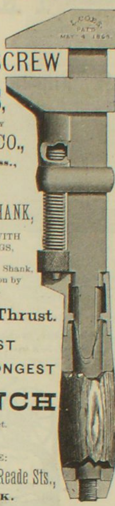

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FERRULE MADE WITH DOUBLE BEARINGS,

Iron Tube Fitted to Shank, held rigidly in position by handle and nut.

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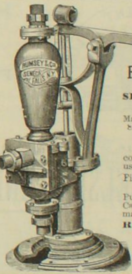
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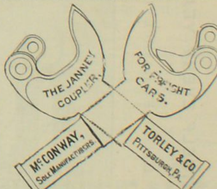
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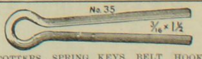

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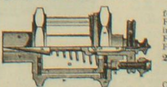

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Pulley Blocks and Iron Sheaves.
Phosphor-Bronze Self-Lub. Sheaves
Pushers, Giant Car, $5.00 each.
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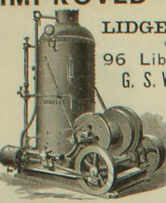

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OFFICE AND SALESROOMS,
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Over 150 different sizes and styles for ALL PURPOSES.

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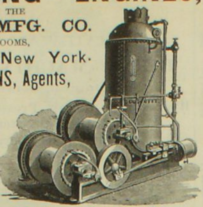

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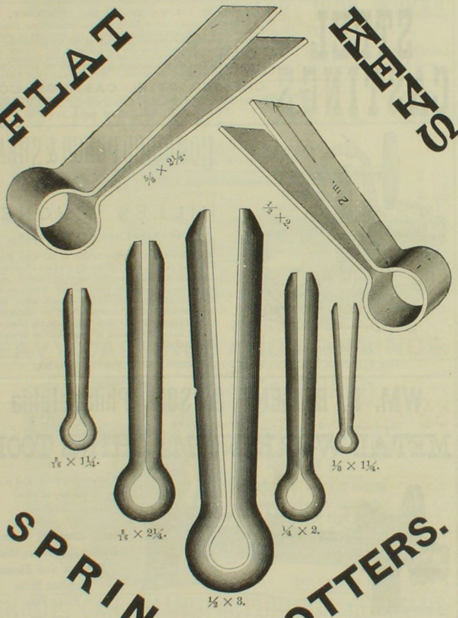
FLAT KEYS



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2 in.
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ALL SIZES OF SPRING COTTERS AND FLAT SPRING KEYS
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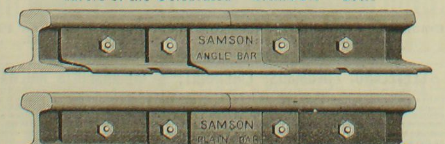
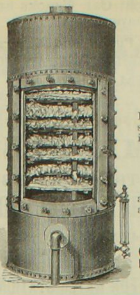
MORRIS SELLERS & CO., Sole Proprietors and Manufacturers of the Celebrated "SAMSON" BAR



And Every Variety of Plain and Angle Splice Bars.
OFFICE, 6 ASHLAND BLOCK..........Mill, Chicago Ave. and the River. ....CHICAGO.



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PATENT LIME-EXTRACTING
HEATER AND FILTER
COMBINED,

Is the only lime-extracting Heater that will prevent scale in steam boilers, removing all impurities from the water before it enters the boiler.
Thoroughly tested.

OVER 3,000 OF THEM IN DAILY USE.

This cut is a fac-simile of the appearance of a No. 5 Heater at work on ordinary lime water when the door was removed, after the Heater had been running two weeks.

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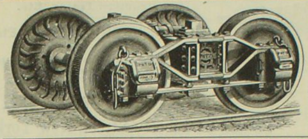

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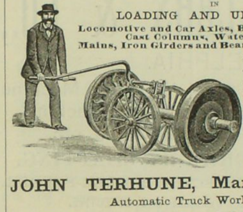
THIS TRUCK IS AUTOMATIC



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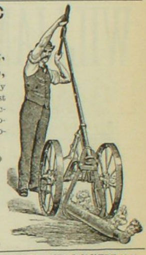

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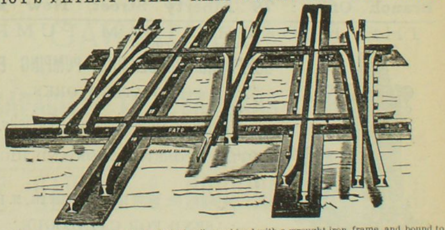

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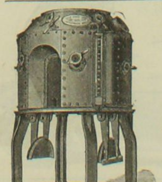

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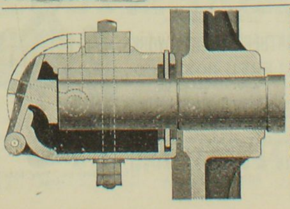

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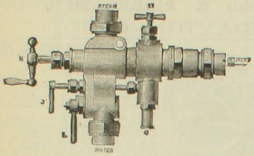

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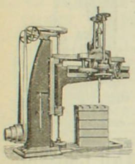

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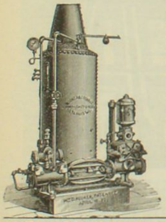

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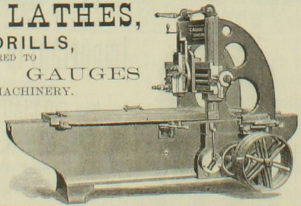

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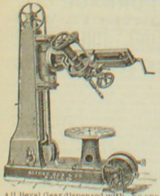

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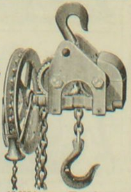

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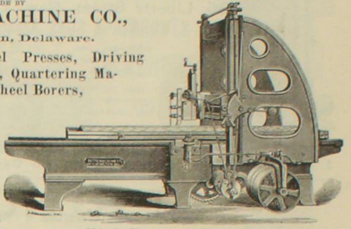

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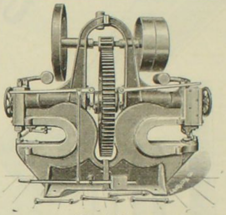

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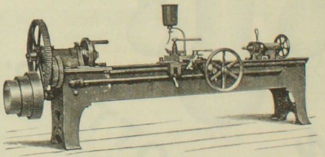

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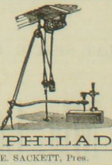

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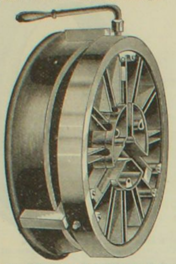

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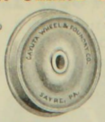
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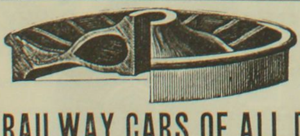

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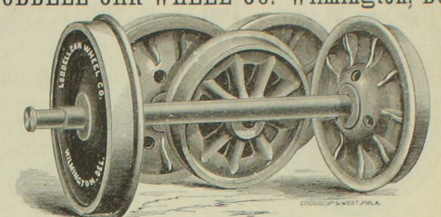
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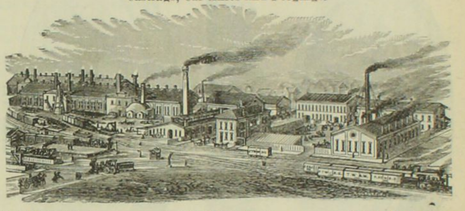

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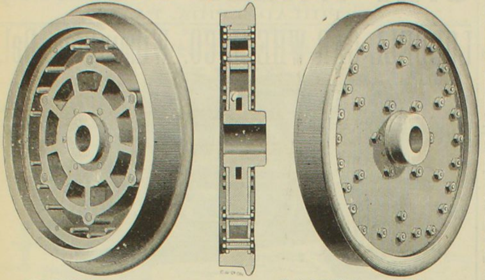

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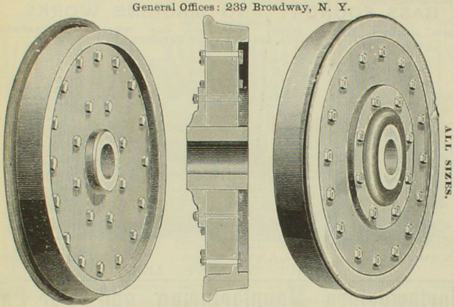

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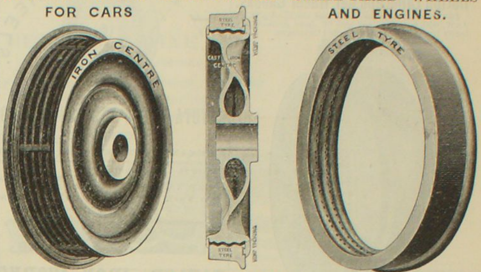

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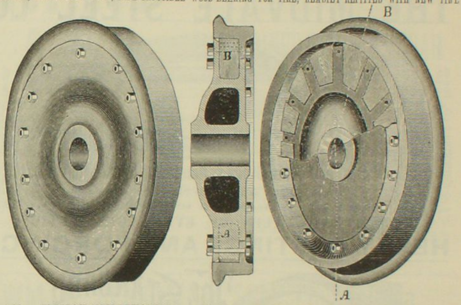

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The GOWAN CHILLED CAR WHEEL GRINDING MACHINE, which we now introduce, is no hasty device. It is the result of four and one-half years experience, and during that time has received a most thorough test, with satisfactory results.

Railroad officials, upon reflection, will admit it is more essential to have a machine to true up Chilled Car Wheels than a Tire Lathe for turning locomotive tires, for this reason: four or more driving wheel tires are required for one engine; a greater number of Car Wheels compose a train; hence the necessity of this invention.

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Wheels with flat places, and otherwise badly worn, that are ordinarily condemned and used for scrap iron, can be ground and fitted so as to double their original mileage. This alone makes our machine the greatest money saver ever introduced to railroads.

A sound Chilled Car Wheel trued by our method cannot be excelled by a paper or any other description of Car Wheel with steel tire.

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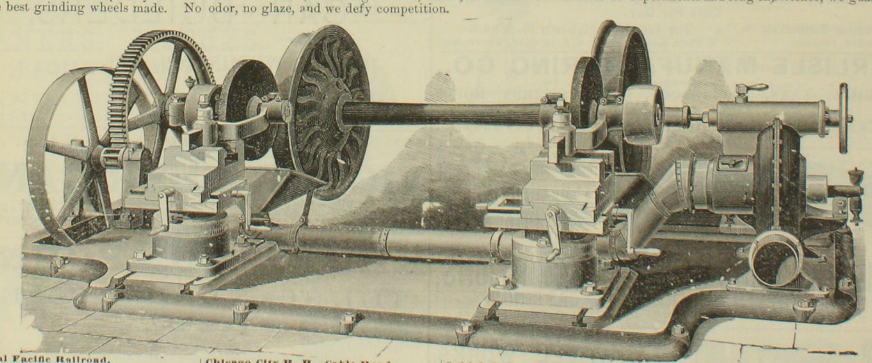
Allowing all new wheels to be 3-32 inch oval, if properly fitted to axles, our machine *will* true up one pair an hour.

We manufacture expressly for use with our machine, Abrading Wheels, which, as the result of a series of experiments and long experience, we guarantee to be the best grinding wheels made. No odor, no glaze, and we defy competition.



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We are prepared to sell machines outright, or to furnish them on royalty for each pair of wheels trued.

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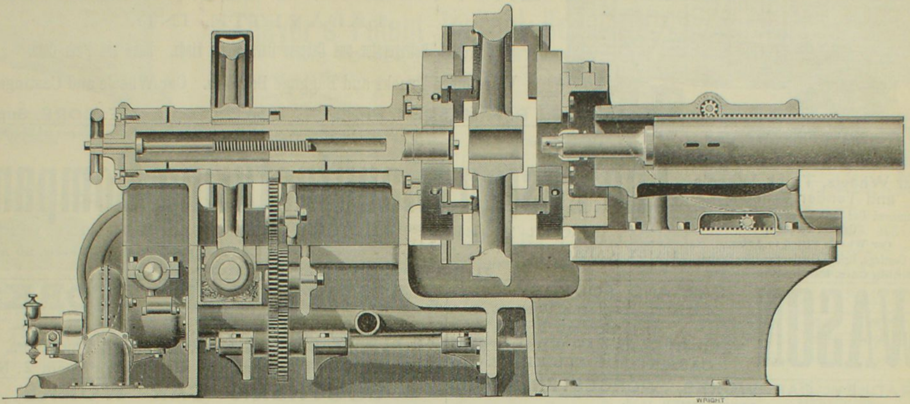

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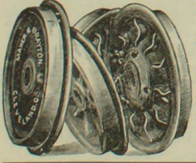

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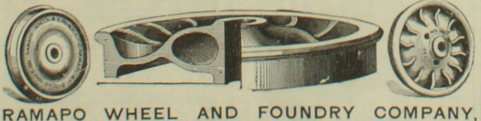

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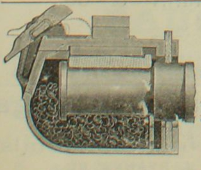

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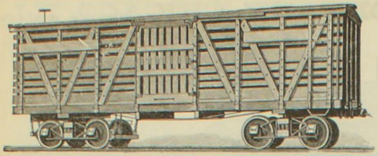

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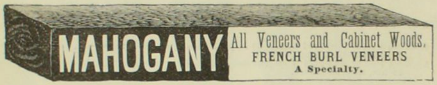

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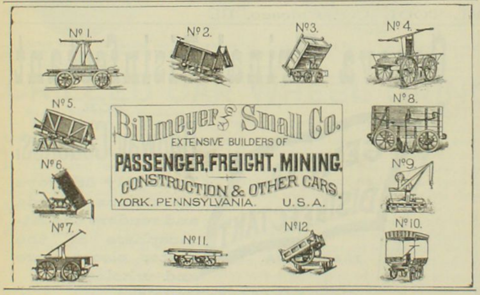

No 1.
No 2.
No 3.
No 4.
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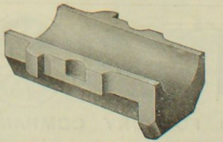

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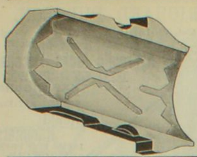

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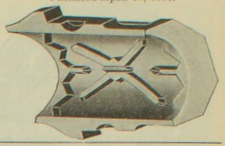

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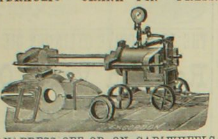

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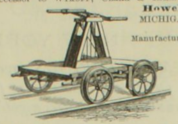

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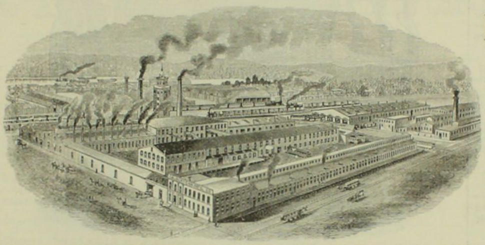

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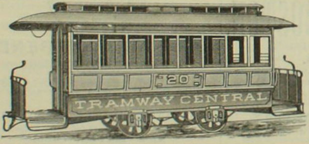

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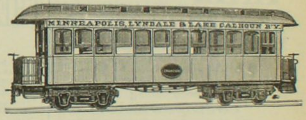

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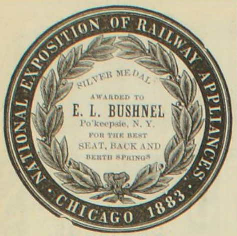

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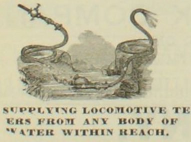

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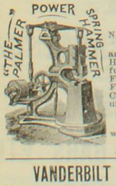

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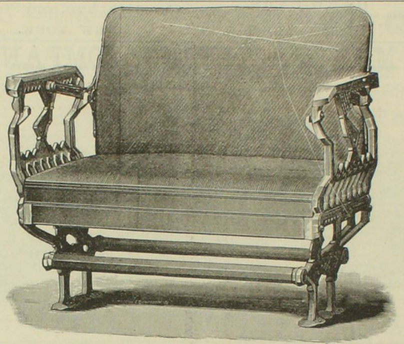

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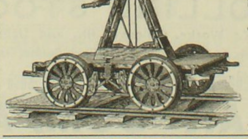

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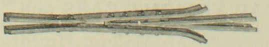

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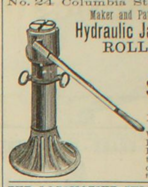

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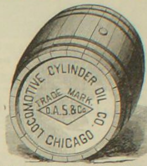

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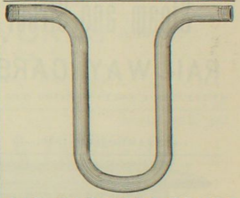

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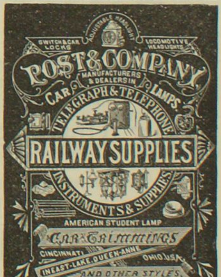

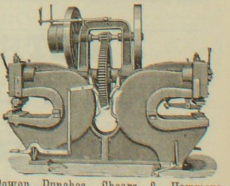

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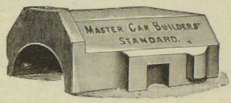
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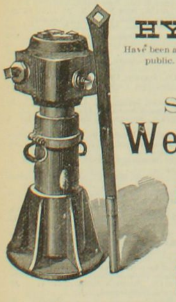

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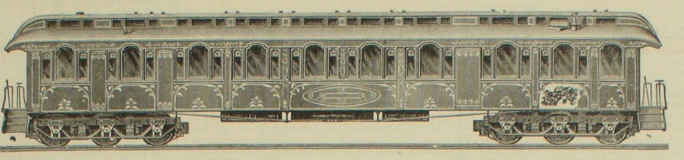


DEVOTED TO THE INTERESTS OF RAILWAY ROLLING STOCK.

VOLUME XV.
NUMBER 10.

OCTOBER, 1884.

SINGLE NUMBERS, TEN CENTS,
$1.00 PER ANNUM.

Miscellaneous Items.

THE Muskegon Car & Engine Co. are building 100 freight cars for the Kansas City, Fort Scott & Gulf road.

THE Mann Boudoir Car Co. has adopted the Cowell Platform and Coupling for its cars, and is now having them put on.

THE Burlington, Cedar Rapids & Northern road is having 500 box cars built by the Barney & Smith Co., Dayton, and 200 by the Peninsular Car Works, Detroit.

THE Allison Manufacturing Company, of Philadelphia, have just shipped a lot of 66 cars to South America, consisting of box and flat cars of various gauges.

MR. JOHN W. GARRETT, President of the Baltimore & Ohio Railroad Co., a position which he had held for 26 consecutive years, died at Deer Park, Md., Sept. 26, aged 64 years.

THE Merchants' Dispatch Transportation Co. have just ordered 250 new cars, of which 125 are to be built by the Buffalo Car Works, 50 by the Pullman Works, at Pullman, Ill., and 75 at Detroit, Mich.

AN order for Tiffany refrigerator cars has just been completed by the Peninsular Car Works, at Detroit, for the Chicago, St. Paul, Minneapolis & Omaha road; also 100 of the same cars, by the Lafayette Car Works, for the Commercial Express Line; and the Haskell & Barker Car Co., Michigan City, are building 50.

THE car shops of the Great Western Division of the Grand Trunk Railway, at London, Ontario, were burned on the night of Sept. 20. A number of cars that were in course of construction, and a large quantity of tools and machinery, were destroyed. The destruction was rendered more complete in consequence of a short supply of water. The loss is said to be covered by insurance.

A NEW compound for welding iron and steel is made up of the following elements: Four pounds of borax, 1 pound of white-marble dust, 1 ounce of steel filings, 2 ounces of charcoal, ½ ounce of saltpeter and 1 ounce of pulverized prussiate of potash. These ingredients are pulverized and then mixed, so that all the elements become thoroughly compounded. This mixture has been patented by J. S. Wilkins, of Cincinnati, Ohio.

THE following table, compiled by the Engineering News, shows the different gauges of railways on this contintent and the number of roads or systems and the approximate mileage of each gauge:

Gauge.	Roads or systems.	Mileage.
6 ft....	2. ..	38
5 ft. 6 inch..	2....	76
5 ft. 3 inch..	1 ...	3
5 ft. 2 inch..	1....	8
5 feet	47 ...	11,478
4 ft. 9½ inch	1 ...	57½
4 ft. 9 inch..	35. ..	11,631
4 ft. 8 inch..	8 ...	1,220
4 ft. 8½ inch.	309....	95,649
4 ft. 3 inch...	3....	75
4 ft. 1 inch ..	1....	5
3 ft. 6 inch..	9....	514
3 ft. 4 inch...	1....	9
3 ft. 2 inch...	1....	48
3 ft	108....	8,672
2 ft...........	2. ..	34

AN oiler for car axles has been brought out by J. Gibbons, of West Troy, and G. R. Meneely, of Albany, N. Y. A two-part frame is made to hold a wick, the ends of which are adapted to be immersed in oil contained in the bottom of the journal-box. The parts of the frame are hinged together on one of the edges, and provided with an intermediately-placed spring which forces the upper part of the frame and the wick up under the car-axle. The device can be applied to the ordinary axle-boxes without their reconstruction.

THE construction of the Canadian Pacific road through British Columbia may be numbered among the most difficult feats of railroad engineering. The average cost of construction between Emory and Boston Bar, a distance of 29 miles, is over $80,000 per mile. Twenty miles of this has been hewn out of solid granite and carried through 13 tunnels and over 8 large and 14 small bridges. There are 500 bridges and trestle structures between Kamloops and Port Moody. Seven thousand men are now at work and it is expected that the road will be handed over to the company in about 18 months.

A PASSENGER CAR is being built in the shops of the Detroit, Grand Haven & Milwaukee road, in which the windows will be of one sash, containing a 36-inch plate, which may be raised the full height, the roof projection being cut away to admit of it. The corners will be strengthened with rolled iron pillars, and sufficient space will be set off at one end for a toilet room. Five hundred pounds of white lead will be laid over the frame before the panels go on. Four double center lamps will illuminate the car, which will be finished in maple and cherry. Everything is made at the shops even, the head lining.

A JOURNAL brass patented by S. A. Bemis, of Springfield, Mass., is provided at each side of the bearing surface with a curved pending wing that terminates at the ends of the brass. The inside of each wing is cut away or chambered, the chamber being deepest opposite the central part of the brass, while it is quite shallow at the ends. By this construction the inner faces of the wings are held out of contact with the journal, and do not interfere with the oil flow. The oil flows from the ends of the brass along the edges of the wings to their lowest points, from whence it drops into a proper receptacle in the axle-box.

THE "traveling horse palace" just built for Bartholomew's Equine Paradox by the Laconia Car Company, is thus described: It is said to be the only car of the kind ever built, and its extreme length and brilliant colors attracted a good deal of attention. The car is painted a very bright red, almost flame color, which is relieved by the name of the show in large letters, and the names of the 20 horses, each under its own window. On each side, at the head of the car, is a large vignette of Prof. Bartholomew. They are excellent likenesses. The interior of the car is fully equal in point of elegance to the exterior. It is finished in hard wood, oiled, and the 20 stalls are partitioned off with stout wire netting.

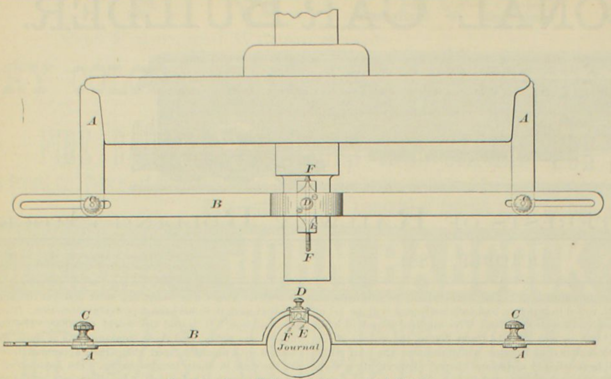
THE John Stephenson Co. are now completing a lot of 20 cars for a street railway in Tokio, Japan. They are 12 feet long and have the Stephenson boxes and pedestals. The outsides are painted a warm brown color, with light striping. Along the main panels is a line of nickel-leaf lettering in Japanese characters, which, in the absence of other lettering or painted decoration, gives the cars a peculiar appearance that attracts considerable attention. The inside finish is in maple, with no ornamentation. The company have recently shipped 100 cars to Melbourne, Australia, which are the first tramway outfit that has ever been built for that city. The cars are 12 and 16 feet in length, some being intended for one horse and some for two. The inside finish is in maple. The company also have cars ready for shipment to Brisbane (Australia), Omaha, New Orleans, Fall River and Brooklyn, and Chili and Venezuela. Seven towns in Central America have roads equipped with this company's cars; also eight towns in South America, six in Australia, and some lines in South Africa, New Zealand and Batavia (Java).

THE Fitchburg Railroad Company has recently put in use a number of Eastman heater cars, which are thus described: The car looks like an ordinary box car, with the exception that there are two funnel-shaped apertures projecting from the roof. Under the center of the car is a box lined with zinc, which contains a kerosene stove, the reservoir for the oil being located underneath the floor of the car, a lead pipe conducting the oil to the stove. By the scientific adjustment of a metal valve, the flow of oil is regulated by the state of the atmosphere, so that as the cold increases the flow of oil is increased, and of course the heat thrown out by the stove increases in the same ratio. The ends, sides and floor of the car are double, having air-chambers between, and so connected with the stove that the warm air is in constant circulation under the car and around the sides and ends, entering the car near the top. Double doors are also provided. The oil reservoir holds enough to last two weeks, and being automatic in its working, the stove requires no attention beyond lighting when the car is loaded, and turning out the light when it is emptied. It will readily be seen from this description that the advantages over the old method of transporting fruit and vegetables are many and great. The car is more warmly constructed, the entire contents are surrounded by a warm air-chamber, and articles at the end are kept as warm as in the center.

A WRITER in the New York *Commercial Advertiser* poetizes as follows: "He had often laid before himself the career of a successful railroad man as preferable to almost all others. There was something solid and yet romantic in it that gave it, in his eyes, a powerful attraction. It was based on iron. It bound the world together. The machinery was noble; and those smoking bolts of trade, discharged with precision, sped along their appointed tracks like the stars in their tangled orbits. The locomotive is the most human of machines: it breathes, eats, works and sleeps; it is emotional; has the sulks, groans and pants under heavy tasks, yet rejoices in its strength; is patient and resolute, and finally rushes proudly home on time; it is a thing to love, and men have died for it. Then, as a business, the carrying trade was most alluring to him through its enormous bulk, its usefulness, the honesty and nicety of attention it involved, the high and various intelligence demanded, the stalwart attributes of human nature, energy, fidelity, competence, virtue, courage and the like called into action, and the opportnnity and scope it furnished for the most splendid ambition. And of late its political bearing had impressed him. There was a time when gentility chiefly consisted in killing people, and the warrior, or professional homicide, was the greatest man; but the new kings are the kings of trade, and our new nobility boards of directors. Hence he longed for the wealth, power and standing of the successful railroad man."

AT Wilkes-Barre, Pa., both large and small locomotive engines are built, and the difference in respect to size and capacity between the two extremes is very striking. The heavy consolidation engines built by Mr. Mitchell, the Superintendent of the Wyoming Division of the Lehigh Valley road, weigh nearly or quite 100,000 pounds, while some of the mine engines and light locomotives, built by the Wyoming Valley Manufacturing Co., of Wilkes-Barre, turn the scale at 21,000 pounds. In regard to this latter class, it may be said that their use is steadily on the increase, including both narrow and standard gauge, and that for many kinds of work in and about mines, in lumber districts and elsewhere, they can profitably supersede horses. One type of these engines having 9 × 14 in. cylinders, stands only 5 ft. 8 in. high, and has 27½-in. drivers. The wheel-base is 4 ft. 6 in., and the length over all is 17 ft. For work above ground, engines are used with 37-in. wheels. They have regular cabs, domes, and longer smoke-stacks, and resemble in appearance tank switching engines with four coupled wheels. There are others of greater power, weighing 26,000 pounds, and having six coupled wheels. For use in mines, these engines are 5 ft. 7 in. high, have 10 × 14 in. cylinders, 27½-in. drivers and 5 ft. 6 in. wheel-base. The boilers are of Otis steel throughout. The tank covers the boiler and the smoke-stack passes through it, but does not extend above it. The main-rod couples upon the trailing driver. The cost of repairs is very small owing to the moderate speed and insignificant wear and tear.

THERE is one thing in railway management that is apt to strike close observers as not being quite up to the mark, and that is a certain kind of neglect that is becoming noticeable in the care of station buildings, especially large ones. Considering the uses of these structures, it is not expected, of course, that they can be kept as clean and as unsoiled in every part as when they were new. In many cases, however, the inside of the roofs become very much blackened with smoke and dust, and if there are windows in the roofs, the outside aacumulation of dust interferes very much with the light which the windows are intended to let into the building where it is so much needed. The dust also which lodges on the trusses, rafters and projections of every kind, is permitted to remain undisturbed for a length of time, marring the beauty of the construction where there was any beauty at first, and imparting a dingy if not dismal appearance to the whole interior. In these days, when so much attention is given to the designing, decoration and furnishing of station buildings, in order to make them as attractive as possible to the patrons of railway lines, it will pay to brush down the roofs from time to time, keep the windows clean, whitewash rough walls where it will help the light, and dislodge the dust wherever it can be got at. The public are beginning to appreciate these things just as they do the handsome cars, the floral decoration of station grounds, and other attractive and tidy looking things, that tend to soften the rough features of railway operation.



Combination Wheel Caliper and Gauge.
August, 1884.

Novel Car Wheel Gauge.

We are indebted to the *American Machinist* for the accompanying cut illustrating a combined wheel caliper and gauge which is now in use on the Northern Pacific road.

The bar *B* is of ¼″ by 1¾″ steel, slotted at ends to allow the arms *A* to be adjusted to different diameters from 33″ to 42″. Through the saddle *E*, which rests on the journal *A*, pin *F* slides freely ; when the arms *A* of the gauge are properly adjusted to the flange of the wheel, the pin *F* is moved in until the point touches the collar of the journal and is there secured with the thumb-screw *D*. The gauge is then applied to wheel on other end of axle, and any differences of diameter or location of wheels on axle readily seen.

Mr. H. J. Small, Ass't Superintendent of Machinery of the road, at Brainerd, Minn., writes to the above named paper, that since the gauge has been in use more than one pair of steel-tired wheels (which had been fitted, with full faith in maker's "pair numbers") have been returned to shops to have diameters made uniform, and but few wheels were found to be accurately located on axles. This device in not patented.

Roadmasters' Convention.

The Roadmasters' Association of America held its second annual convention Sept. 10, in Indianapolis, about sixty members being present. The association is the successor of the International Roadmasters' Association, the members of which body having disbanded at Niagara, two years ago, organized the present body in Chicago, in June of last year. J. Burnett, of Joliet, Ill., Roadmaster of the Chicago, Rock Island & Pacific road, presided. C. R. Meeker, Secretary, resigned the position some months ago, and the President has been acting also as Secretary. His report of the affairs of the latter office shows that the association enrolls eighty-five members, and forty-five applications for membership are awaiting the action of this convention. Nearly every State in the Union is represented by these members, and the roadmasters of all the great trunk lines and the greater number of the more important Western roads are included in the membership. Thomas Adamson, of Lawrenceburg, Ind., Roadmaster of the Ohio & Mississippi road, Treasurer of the association, reported: Total receipts for the past year, $372; expenditures, $161; cash on hand Sept. 10, $211. The officers beside those mentioned are John C. Brennan, of the St. Paul & Minneapolis, and James Sloan, of the C. & C. I. Railroad, Vice-Presidents; J. H McDonald, W. H. Clintock and S. L. Swinney, and the President, members of the Executive Committee. The association visited the Cincinnati Exposition in a body on a special train over the Big Four and thence to Louisville over the Cincinnati Southern. An interesting display of railroad appliances was made in connection with the convention.

AN important new departure in railway lighting is reported from the district where the passenger railway had its birth—the Liverpool & Manchester line of the London & Northwestern Company. This is the utilization of electricity for lighting the carriages by the help of Swan's incandescent 20 candle-power lamps and Brotherhood's patent engine, stationed on the tender and fed with steam from the locomotive boiler, locomotives being specially fitted for this service. The electric current passes from the engine, through the train, and back to the locomotive, where, fixed to the footplate, is a regulator fitted with an electric burner showing the driver the power of light in the train. Each compartment of the train is fitted with a duplicate lamp, the arrangement securing the instant lighting of one lamp if the other should become extinguished.

THE Michigan Car Co. are building 100 freight cars for the Chicago, Burlington & Quincy road.

CINCINNATI papers announce that Mann boudoir sleeping cars have just been placed on the line of the Ohio & Mississippi Railway between that city and Louisville.

THE Chicago & Northwestern road is now making a trial of a new locomotive with a Coventry boiler, which, if it does what is claimed for it, will solve the problem of smoke consumption on locomotives. The locomotive is a standard engine, with 5-foot drivers and 17 × 24 inch cylinders. The boiler is a 60-inch shell of Otis half inch steel, with a capacity to the water line of 1,200 gallons of water. A very large amount of heating surface is exposed, having 143 two-inch flues in the water and 53 three-inch flues above, part of which are in the water and part in the steam. The heat is carried from the fire-box through the lower or two-inch flues to the smoke-box in the front end, where it strikes a deflector and is returned the length of the boiler through the upper three-inch flues to a smoke-box next to the cab, and ejected from the stack in that portion of the boiler. Thus by the heat traversing the boiler twice it acts as a partial super-heater in returning through the three-inch flues, and better combustion is secured, the heat being longer retained and given a chance to expend all its usefulness in the mass of steam and water, instead of being shot by an immense draft directly up the stack. The draft is said to be steady.

Working of Traffic upon Single Track Railroads.

The following is a portion of a paper on the Working of Traffic upon Single Track Railroads in Canada and the United States, read by W. K. Muir before the British Scientific Association at its meeting in Montreal, August, 1884:

Now let me try to briefly explain to you what is supposed to be about the best way in this country of operating our single track railroads. We shall suppose, then, that the track is laid and fenced and in reasonably good condition, the rails well tied (we call sleepers ties), the track in line to gauge and properly leveled, the outside curve rail laid upon acknowledged rules as to height, sufficient ballast and drainage, equipped with a proper telegraph line and offices, the rolling stock and other equipment being in good repair, for with bad track, defective locomotives and cars (especially freight), unfitted for the service now required of them, it would be hard indeed to make any kind of acceptable running time, either by time card or with the assistance of the telegraph.

There should be stations or side tracks about five miles apart, according to suitable location, upon as much as possible level grades, and the approach from either end to them upon a straight track. I would suggest that a side track, the length to be determined by the amount of traffic to be moved, should be laid on each side of the main track at these places, with a three-throw switch at each end, and a three-throw switch in the middle, thus having only three switches in the main track ; the disks and lights on the switches should show which way the switch was thrown ; these tracks should accommodate several trains on their respective sides of the main track bound in opposite directions, and would also permit of trains bound in the same direction getting out of the side track when in the rear, and when they had to take precedence, without disturbing the train ahead.

The tracks for the business of the depot should diverge from these side tracks, so that cars standing at the station would not be in the way of, or be interfered with, by trains switching to meet or pass others ; the location of water columns and fuel platforms should be such as would permit of this service being promptly performed while the train stood at the depot for traffic purposes.

There should be a distinctive mark distant from, and upon each side of all level roadway-crossings, so that the engineer can readily see it night or day, to give warning of his approach, and if the topography of the country admits, there should be no crossing of other railways upon the level, but when upon the level there should be in use the safety-switch on each side of the crossing, worked from the signal man's box, the home-signal attached to the switch-gearing, the switch always set for the siding and the danger signal shown, except when changed with the switch to let a train proceed, so that no train could possibly foul another.

Draw-bridge approaches should have the same kind of safety-switch; stations, junctions and side-tracks should be provided with spectacled-semaphore arms and lamps. I think these distant semaphores are safer than the pole and ball or semaphore-arm signals *set up close by* junctions and crossings.

Level-crossings in cities and towns, in addition to gates and gatemen, should be protected by electric bells, worked by the trains as they approach ; signal-towers can also be profitably used and with increased safety to the public and train service, not only on some portions of the main track, but at level-crossings and at junctions and yards.

If the road should unfortunately have a draw-bridge, it should be worked with an electric signal attachment, so that when the continuity of the main track is disturbed there shall be both *bell* and semaphore-signals at a distance, and these heard and seen by the bridgetender so that he would know they were working.

The freight business is reasonably well handled in many respects so far as collection and delivery, but there is room for important improvement in getting passengers and baggage to stations; and without going into detail as to how passengers might be ticketed and baggage checked in city offices and baggage collected and taken to the train as our American system rather demands, it may not be out of place to explain how the baggage of the passenger is checked with a strap metallic check, attached to the baggage, the duplicate given to the passenger, he seeing that the number upon the check he gets agrees with the number on the check put upon the baggage, as a precaution against mismatching, although the station baggageman is supposed to compare them before taking the check off the strap and handing it to the passenger.

For local or way baggage the number of the station is put upon a card or tag attached to the check, or the number of the station is chalked upon the baggage, and by these station numbers the train baggagemen handle and work the baggage to destination.

For through baggage, or baggage passing over several lines of railway, a reversible check is used, the strap covering the name of the forwarding station and showing only the destination. This check can be used on the return trip by changing the strap and putting it through the eye-hole in the other way, so that the starting point covered by the strap going, becomes the destination on the return trip, when the strap is reversed.

The passenger, with these metallic checks in his possession rests contented, he can leave his baggage at the depot by not claiming it at destination, or by giving his check to the omnibus agent or expressman, go his way knowing his baggage will be taken to whatever point he may name. This is a great advantage over the paper labels that plaster your baggage in Europe and which even then must be claimed at once on arrival of the train and on the depot platform.

The train baggageman shows on his way bill where numbers on checks were taken on and where left off; by these way-bills baggage can be traced if any mistake has been made in leaving it off.

Then there is the transportation of grain in bulk. It is unloaded into pits in the elevators, taken by metallic buckets upon belts into bins above, or taken from vessels by elevator legs, belts and buckets; scooped out from the hold, or shot into the hold by spouts from above. This is also a quick, cheap and effective process of cooling and cleaning grain. It is inspected, graded, weighed in and out, spouted into cars to be taken long distances and put into vessels or barges through other elevators. This mode of handling grain is very different from the slow, expensive, old country style of bagging and storing.

There is also the system of handling light freights, money and valuable packages through the express transportation companies and by passenger trains, which is also well worth considering.

Let me also call your attention to the system of handling live stock in the yards belonging to the railway companies; of feeding, watering, weighing, loading or unloading and transportation winter and summer ; the process of caring for stock on the journey, of watching, watering and feeding, also the immense refrigerator car traffic in dressed meats, dairy products, fruits, oysters and fish, and last, though not least, the transportation and care of humanity in luxurious sleeping and dining cars, which, for the long-distance traffic, is hardly surpassed on the other side of the Atlantic.

Suppose that we have properly equipped trains, and something to run with, and a suitable track to run upon, and trusty men in charge of the train; that would mean for a passenger train, bodies of coaches and windows thoroughly cleaned, outside of axle boxes and running gear scrubbed with a brush and lye solution, and all oil and grease cut off; the running gear and air brakes known to be reliable, the bell-rope properly strung from the engine cab to the end platform of the rear coach and tested to see that it is OK ; the cars internally scrupulously clean and turned to have saloons always at rear, water coolers filled with fresh ice-water, lamps trimmed, good ventilation, the temperature moderate, a thermometer suspended in the middle of the car to guide in regulating the temperature, the trainmen neat, clean, perfectly sober and in uniform, the baggageman in his car and the conductor (who is responsible for the working of his train, and for the tickets or fares and comfort of his passengers) know that every thing about his train is right; as regards signals, two red and two white flags, two red and two white and his own lamps, and the tail and side lamps, ax, saw and hammer in each coach, and in his *tool box* in the baggage car a wrench, waste, oil, wick, detonating signals, dope, the proper signals on front of the locomotive, neither he nor his men smoking on duty, and all alert and attentive to train work and passengers and baggage; know before he starts from the telegraph office about trains due and their position.

On the journey, one brakeman should always be about upon the rear car, the other on the front end of the train, near the baggage-car, and the conductor, upon nearing stations at which he means to stop, somewhere between the baggage car and the middle of the train, and when he does stop and before he starts, his men can tell him by signal or voice whether every thing is right front and rear.

The freight train men should know that the running gear of their cars is apparently right so far as they can see, the coupling links and pins of cars safe, no bolts dropped through the draw-bars and used for ordinary pins, their caboose, or conductor's car, neat, clean and comfortable, with their kit of lamp, torpedo and flag signals complete, spare links and pins, a crowbar, a set of portable frogs, a tail rope, two torches, chain, ax, saw, and wrench, supply of dope, or common brown soap and wood ashes, waste and oil.

If the train has a passenger coach and running as a mixed train, there should be a bell-rope strung from cab of engine through open cleats on the roof of the freight cars to the rear platform of the coach; the caboose car should have side brackets for tail signals.

The trainmen should be seen by the yardmaster before they leave, and he should know positively that they are sober, fresh and well-rested; one brakeman on front (possibly on the engine), to operate from that end, the conductor and other brakeman on the rear end of the train. The peddling car, with light station-to-station freight, should be near the front end.

There should be a standard time regulating the movements of all and every thing in connection with the train service; certain clocks in certain places, as a guide and by which the men can regulate their watches; the time should be telegraphed at noon to all accessible points on the line, so that all clocks and men's watches could be kept uniform; and here let me call your attention to the proposed 24-hour dial to avoid the A. M. and P. M.

There should be a working time card showing all the trains in each direction with their meeting and passing places. All trains likely to be run should also be shown; it is better to have them in the time card and to cancel them when freight traffic does not warrant their being run, than to make special arrangements and take risk of trackmen and others not being warned: besides, at times it is convenient to have other trains, engines running light or with a caboose, take and run upon that time.

The running regulations should be briefly but very plainly expressed, stating what time-rights trains had, to where, how trains were classified, what kind, and how signals day and night are to be given.

The rights of trains in the event of some getting late and unable to make their time table meeting points, are very important; the instructions regulating these should be so distinct that in the event of no telegraph arrangement, trainmen could safely proceed against and upon the card time of a train from the opposite direction, which had from some cause become delayed, and by the rules had to keep out of the way for a specific time; and as trainmen as a class are a sort of peripatetic lot of men, changing from one eailroad service to another, it is most important for railroad companies and their patrons that some fixed system of signaling and running should prevail upon all roads.

In rare and urgent cases, when a freight or inferior class train is on a side track, and wants to be flagged to the nearest telegraph station, in the direction in which the passing train is going, so that this "laid out" train, as it is called, may get orders, a train of the same or inferior class may be signaled to flag it in daytime only, by the conductor of the "laid out" train standing at the front of his engine exhibiting a red flag held out toward the track, but depressed at an angle of forty-five degrees, and his engineer giving short, sharp whistles, so that the engineer of the approaching train can hear, and be answered by him in the same way; the fireman of the passing train shall then exhibit and put on the front of his engine a red flag, and flag the train to the first telegraph station, and the engineer and conductor shall see that men on trains (if any they *pass*) are cognizant of this signal.

On the locomotive, a mirror set up on the cab would enable the engineer to see and know the condition of his freight train, whether cars were running all right and in line or when any of them caught fire, but he should have the ordinary locomotive head-lamp in good shape, and I suggest with movable numbers, to slide upon a bar in front of the glass, indicating the number of the train, for the guidance of the dispatcher, train, track and stationmen. These should be put on by the engineer before starting. If it is an ordinary time card train the card will indicate his number. If it is an extra train the train dispatcher will give him his number, and his train will be known by that number on the journey. This head-lamp should also have red and green curtains that, when necessity requires, can be drawn across the face of the lamp at night, indicating caution or danger, or that the train is upon the side track and quite clear of the main track. The engineer can flash this signal in a moment from the cab of his engine by means of cords led from the lamp. These signals are made by oiled colored silk mounted on spring rollers set in tin cases as shown in the accompanying sketch.

The advantage is that the engineer can flash a large danger signal to an approaching train, or by pulling the green curtain indicate to the approaching train whether he is upon the side track and clear of the main track and the switch all right.

The engineer carries the black tin plate numbers up inside of the roof of his cab, and these numbers slide upon a movable bar, on the face of the lamp. They do not obscure the light and they shine through the colored curtain, and in day-time the numbers are equally distinct.

I think this number *in front* is safer for passing trainmen and for stationmen, than the number of the locomotive painted on the side of the lamp, or the number displayed upon the caboose at the tail end of freight trains.

The Painting of Passenger Cars—Light vs. Dark Colors.

[Paper read by Mr. R. McKeon, of the New York, Pennsylvania & Ohio road, at the anual meeting of the Master Car-Painters' Association, in Boston, Sept. 3.]

The manufacture of railway cars is a great and growing industry, and as the increase in mileage goes on the demand becomes greater. We therefore see the importance that attaches to passenger car building, as well as to the general repairs of all classes of cars in our railway shops, and which requires that each department of the work be placed under the supervision of practical men who have acquired a knowledge of their trade in the car shop, and are well acquainted with all the details of the construction and finish of cars. Each of the several departments calls for mechanical ability, and good management on the part of those in charge, so that a system of working may be followed that shall produce the best results with the least expense.

The painting of railway cars is progressive, and to-day commands equal attention with the other departments whose duty it is to care for the rolling stock of the road, and progress is expected to be made by those who are intrusted with the supervision of the paint shop. We are not merely to follow in the wake of those who may have gained some little notoriety for their success in work and management, but we should reach out in search of improvement, our aim being to make some progress in the art. The painting of a first-class passenger car is of more importance than many of our railway officials may at first thought imagine; at least it would seem to be so from the fact that it is frequently the case that the time taken to paint a car is considered as so much loss of service of the car to the company, when a little investigation would convince them of the necessity of proper time being allowed to do the painting, which, when done, would be alike creditable to the road and to the shop.

Cars are painted not only to add to their beauty and attraction—two important points in painting—but are painted for their preservation. The appearance of a car plays a very important part in the traffic of a road. Many of our Western lines have built up their reputation on the interior finish and decoration of their cars, as well as in the good taste shown on the outside painting; for let a car be devoid of beauty and faulty in design, or bad taste be exhibited in its finish, and it is not suitable for the place it was intended to fill. It is, therefore, a wise policy for railway companies to show a reasonable amount of pride, and the paint-shop is one of the places in which to study out the tastes of the traveler, and to blend together in harmony the colors and designs which will please the eye and command the approval and the patronage of the public. But how shall we economize in car painting? That is a very important question, and, in fact, is the leading question of the day, not alone in the paint-shop, but in all other departments engaged in the building and repairs of cars, and it will be our object at this time to show the management of our roads how to save expense on the passenger-car painting by referring them to practical tests, together with an experience of one-third of a century in the railway paint-shop.

During the past fifteen years a considerable reduction has been made in the cost of painting, and the credit we think is in a large measure due to the labors of the Master Car-Painters' Association, who will continue their efforts to further reduce the cost of work and to show where economy may be introduced without detracting from the wearing qualities or the durability of the painting. The color of passenger cars for some years has been hard to decide. No fixed standard has given entire satisfaction, and numerous changes have been made. I know of roads that have had four different standards of color in the past twelve years, but they were all of a dark shade. The consequence is that very few roads have their cars all of a color, which does not show very good taste, and certainly not good judgment, on the part of those who had the power to make the changes. Therefore we think that a uniform standard of color on all passenger train cars of a road would be the most important step ever taken towards economy. I am decidedly in favor of light shades of color for passenger cars. A long experience in their use has convinced me that it is economy to use white lead for a finish. It is true that dark colors have been popular of late years, so much so that many hesitate to advocate what they know to be the best for wear, but we should not be tied down to any standard of color or method of working when we are convinced that it is not producing good results. We must seek for something better, embracing every opportunity to add to our knowledge of the pigments employed, for unless we exhibit such an interest in our labors we are not fulfilling the entire duty we owe to those who employ us. There are too many men who fail to advocate economy, and who follow the method that is indorsed by some leading road or shop, in place of showing in their work by practical facts what benefits would be gained by making a change in the methods employed, and instead of adopting a standard of color at the simple suggestion of some road official, first take into consideration the value of such color, its adaptability to the work, and whether it would be for the interest of the road to adopt it, when a plain statement might be made setting forth your objections to the pigment or color proposed to be used.

The painting is about one-twelfth of the cost of a first-class day coach, which includes labor and stock, and must be renewed from time to time; and being a protection to all other parts of the work, it must be watched carefully and treated at the proper time, or we not only destroy the painting and the decoration, but neglect will ruin the entire finish. Twenty-five years ago, and later, most of the passenger train cars of our principal roads were painted a light color—yellows of different shades being generally used. White lead was the foundation and the finish of the car, and lead in those days was manufactured honestly; it was not thrown on the market half corroded and poorly ground in cheap adulterated oils, as we find it to-day in many places (although I am glad to learn, from those more fortunate than myself, that a few reliable manufacturers still exist). But a change came in the color of cars, and changes are not always beneficial; competition brought out new colors, anything for attraction, and a ground work was introduced for the sole object of setting off the decoration on the outside of the car to greater advantage. Economy was not thought of; it was a matter of less importance in those days than now; but a change was made from the straw colors to the umbers or darker shades, which involved an expense of one-third more in the first cost of painting, while the life and service of the car was one-third less than it had been with the light colors.

We do not attribute all this saving in expense to the use of light colors, but just as soon as a change is made from a lead finish to any of the popular shades, such as umber brown, chocolate, Pullman color, olive and Quaker green, Tuscan red, or, in fact, any color where no lead enters into the mixture, then we lose at once the wearing quality, for it is the exposed surface of a paint that tells. This is the protection to the entire body, and a lead foundation will not help the finishing color if composed of the pigments we have named, but carry the lead all through and we have a durable surface, we have a car painted that will pay for the labor expended on it, and we wish the companies we represent here to-day might be convinced of the facts of our argument in favor of straw color on their passenger cars, which is the first step toward economy in the painting department of their road. We can show them that this is where a great saving might be made, and with more care in the purchase of paint stock, we can assure them that they would have more cheerful and attractive cars in place of the dingy, dull, and lifeless ones which now confront the traveler in many of our railway depots, and the varnish on such colors would also retain a luster much longer and do better service by having the lead finish for a foundation.

While speaking of the superiority of a pure white lead over all other pigments, I would state that no other pigment bears more oil, it is of itself an oily nature, therefore pure linseed oil combines with it better than with any of the vegetable or earth pigments. No one will dispute the fact so well known to all painters, that a lead pigment is more durable and forms a denser coating than any other employed in the paint shop. A solid body, and one that has depth to it, is the main object in a paint; this guarantees durability. A coat of Tuscan red may have coloring matter sufficient to cover the work, but that is simply a stain; there is no wear in it; but lead gives a solid foundation and will hold out the varnish well on its surface. Being less porous or spongy than other pigments, it acts as a protector, for varnish does not decay altogether on the exposed surface, the absorption under it which takes place in all vegetable and earth paints, as well as in chemical productions more than in lead, draws the oil as much perhaps as light and air does on the surface.

Heat is the great enemy of paint, and such colors as are in general use on passenger cars draw the sun's heat, which burns the oil and the life out of the varnish and paint. By repeated tests of light and dark colors, we find that white presents the coolest surface in a hot sun and black the hottest. A gradual scale may be run up, and the heat-absorbing power increases as the colors become darker, the effect being to expand and soften the darker colors. A continual heat would make the paint and varnish elastic, and while in this state, were it suddenly exposed to cold air, the contraction would crack the painted surface; but take a light color and put it to the same test, and we find that it does not draw near the same amount of heat, nor a sufficient quantity to soften the paint and varnish.

I know it is urged that our railway managers prefer the colors they use, and we should, therefore, try to make them as durable as possible. We would not for a moment deny them the right to their choice of color, and we have always labored to secure the best results, but the experience many of us have had with such fugitive colors are far from satisfactory. We can say for light color that it has less absorbing power, hence its durability and less liability to injury by solar heat, as dark shades, or the reds which are so common on coaches the last few years, and which suck in the heat and moisture, making but feeble resistance to the attacks of storm and cinders, having no solid body to resist the sudden changes of weather. Why, then, persist in the use of pigments that are so easily destroyed, or rendered lifeless and dead by constant exposure? But I am aware that some claim the heat theory to be only imaginary, and therefore I do not advance these arguments in favor of light colors simply from my own experience, but I have the practical views and experience of car-painters in various parts of the country, and the large majority tell me that the life of a dark color on a car, particularly in the Southern States, is less than half what a buff or straw color is. The dark color in one case referred to is of an olive shade, which I am informed the heat soon changes to a deep black olive, and frequently the dark cars have to be repainted after only twelve months of service, the paint being too far gone to revarnish, while the buff-colored cars run from eighteen months to two years, and then clean up well and are revarnished.

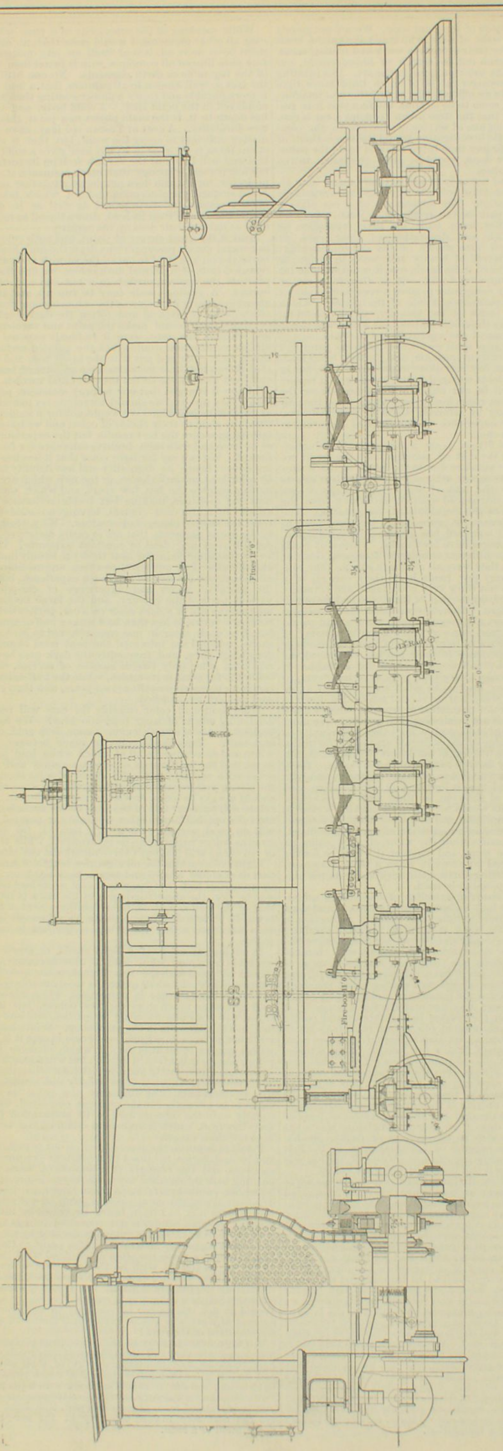
What shades of color suitable for cars will resist the deadening effects of solar heat the best? We have the various shades of straw, lemon, cream, deep gold, old gold and buff. Many shades may be made between a pure white and an orange, in all of which white lead predominates, and the best brands of chrome yellow and yellow-ocher with venetian red. No shade of color should have the strong yellow cast that we have seen on some roads; it should always be toned down, which enriches it. These colors will outwear any of the dark colors or reds now in use fully one half, or in other words, a car painted yellow will do good service, when first painted, for eighteen months before requiring to be revarnished, while the dark or red colors will last but twelve months at the most.

Light colors retain the oil a greater length of time; and that dark colors absorb and retain heat has been proved by numerous tests. If lampblack and white lead be placed side by side, the absorbing power of the black is 100, while that of the lead is only 53, the reflecting power of the lead being 47. Cloth of different colors placed on newly fallen snow also shows that the white is the last to melt the snow.

In mixing car colors of a light shade, or straw colors, we find that a pure white lead is first necessary, which should be tinted with the best French ocher and English chrome yellow. This will make the most durable color for car bodies; the chrome is permanent when mixed with lead, almost as much so as the best ochers, but it is far superior in body and covering properties, and one of the most useful pigments in the paint shop. White lead alone will change from its original whiteness in case it is mixed with a surplus of oil; it is the oil which changes it to a yellow cast as it hardens in drying; but when lead is mixed with some other strong pigment, its color when thus tinted is more permanent, and its density and wearing qualities are increased. The durability of a color we do not claim to be altogether in the pigment employed, but it is equally so in the vehicles used in its preparation for use, therefore lead, which is known to retain oil the best, will hold the color longer.

Painting is put to the severest test on our passenger cars, and its destruction is caused by a constant exposure to the elements and the changes of atmosphere, from a dry, burning heat through the day to a heavy moisture at night, which the painted surface absorbs in large quantities, to be dried out again, the same process going on day after day. But perhaps it is, as I have heard expressed by members, that the foreman painter is not consulted in regard to the color of the car. This is generally decided by those who know nothing of the adaptability of a paint to the work. Freaks of fancy have too often determined what the color of the car should be, with no thought given or questions asked of those who are expected to know the difference in the lasting qualities of a color, nor is the question considered whether a color would wear six or twelve months. Would it not, therefore, be economy to ascertain what amount of wear is in a color before it is finally adopted as the standard of the road?

Our arguments in favor of the light colors probably will not change the views of the officers of our roads. They may, however, find the matter worthy of their attention, and, to test it for themselves have one coach painted any light shade, and put it in service along with a car painted Pullman color or Tuscan red, when twelve months' service will prove what I have already asserted, that light colors are the first step toward economy in the car-painting department of a road.



TWELVE-WHEEL FREIGHT LOCOMOTIVE—LEHIGH VALLEY RAILROAD.

Built by Alex. Mitchell, Supt. and Master Mechanic of Wyoming Division, Wilkes-Barre, Pa.

Twelve-Wheel Freight Locomotive—Lehigh Valley Railroad.

At the Long Branch meeting of the Master Mechanics' Association, the Committee on Improvements of the Locomotive, exhibited, among other things, a photograph and some sketches of an engine built by Mr. Alex. Mitchell, of the Lehigh Valley Railroad, but which by no means attracted the attention which the novelty of the design and the performance of the engine deserved.

It made its first appearance upon the track as a ten-coupled fourteen-wheeler, having a pony truck at both ends. The weight of the engine, however, was but 108,000 pounds, and experiments showed that while the design was satisfactory, so great a number of drivers was not necessary for an engine of this weight. One pair of wheels was therefore removed, and the positions of the others arranged so as to make the rigid wheel-base of the engine similar to that of an ordinary Mogul. As will be seen from the engraving, the engine now has two trucks and eight driving wheels, differing from the Consolidation in having a pony truck at each end and the first and second drivers more widely separated. Instead of a blank tire on the main or second pair of drivers, the trailing drivers are used without a flange, making the rigid wheel-base the same as that of a Mogul.

This arrangement is possible because the trailing truck guides the back end of the machine. The rigid wheel-base is but 12 feet 1 inch, the total wheel-base 29 feet, or 6 feet more than that of the Consolidation engine, while its rigid wheel-base is 3 feet shorter.

As would be expected, the engine is much easier on the curves, and at the same time runs with much less danger of getting off the rails. The forward truck is of the usual pony pattern, with half elliptic springs. The trailing truck has volutes under the side bearings and spirals in deep pockets in the center.

The frame of the engine differs from the ordinary type in having jaws and braces in separate forgings which are bolted together. The main bar is straight to the back end where it is slightly turned up. The first and second pair of drivers are equalized with each other and can be equalized with the pony truck if necessary. The third and fourth pairs are also equalized together. The latter pair have seven-inch plain tires. The driving wheels are 60 inches in diameter, and have 88,000 pounds upon them, or but little more than that which is placed with safety on an ordinary car journal. The leading truck has 11,000 pounds and the trailing truck 9,000. The cylinders are of an unusual size, at least for this part of the country, being 20 inches in diameter by 26 inch stroke. They have De Laney balanced valves and two relief valves on the steam-chest cover. The boiler to supply steam to the cylinders is of Otis steel and is 54 inches in diameter at the smallest ring, and has 288 2-inch flues 12 feet long. It is fed by pumps driven in the usual way from the cross-head, but there is a small injector in the cab for use in case of emergencies or when the engine is standing. The fire-box is 11 feet long on the bottom and 33 inches wide inside at the grate. The "Bee," as the engine is called, has gained for itself a very enviable reputation on the road, and has demonstrated that the principles involved in its construction are correct.

Electric Train Lighting in England.

Those who have watched the course of events in respect of railway train lighting by electricity will be aware that several systems have been tried for this purpose, as reported in our columns, and we believe some of them are still under trial. Three systems mainly have been experimented with, variations in detail being introduced as suggested either by inventors or by railway managers. One of these is the secondary or storage battery, of which a number are placed in the train and the light distributed from them. Another system is that of primary batteries, of which we have heard little or nothing of late. Another method of electrically lighting a train is to fit up a dynamo in it and run the lights direct off it, trusting for the motive power needed for the dynamo to the locomotive or to a separate engine fed from the locomotive boiler. This is unsatisfactory. The light cannot be supplied to the train unless when the engine is attached to the carriages, and as this rarely happens until a few moments before the actual starting of a train from the terminus, the carriages are consequently left in darkness at a time when they require light most. The supply is irregular, and there is the necessity for a separate attendant, whose wages at once stamp the plan as too costly. We do not forget that a system has been tried in which a separate engine and boiler were used, but we are not aware that any practical progress has been made in this direction. The system of train lightning by electricity, by means of accumulators, has been in use on the Brighton Railway for the past two years, having been applied to the Pullman train as reported by us at the time. It has, however, been found to be slow, inconvenient and expensive. In the first place, a steam-engine is required for the dynamo to charge the cells. Next, there is the rent of premises and the wages of an attendant. Then there is the cost of carrying to and from the train the cells when charged and discharged, and the injury occasioned to them therefrom, for while it is admitted that the traveling in the train does not appear to affect the cells prejudicially, it is beyond dispute that repeatedly shifting the position of cells is most undesirable.

These drawbacks long since presented themselves to the mind of Mr. Stroudley, the Locomotive Superintendent of the Brighton Railway, but he saw that both the accumulator and the direct dynamo system possessed advantages which, if the two systems could be blended, might produce satisfactory results. In conjunction, therefore, with Mr. Houghton, Mr. Stroudley has devised and perfected such a combined system, and it has been carefully and successfully tried on the Brighton line. This system—which is being introduced by the Railway Electrical Contractors, Limited, 4 Great Winchester street, London—comprises the utilization of power from the axle of the engine by an arrangement of belting and shafting on the spindle of the dynamo. The working apparatus consists of a dynamo machine of the necessary electro-motive force, and an accumulator of sufficient power to absorb the output of the dynamo when no light is required, and to add to such output the requisite supply of current when the whole of the lamps are on. Beyond this, and most important of all, there is a device which automatically excites the field magnets of the dynamo prior to the closing of the circuit, shuts it out of the circuit until the speed of the train is such as to create a force in the dynamo sufficient to charge the cells, or when the speed is so reduced that the force of the dynamo is less than that of the cells, then to cut the dynamo out of the circuit, as otherwise the cells would play back on to the dynamo. The apparatus also prevents any excess of current being generated in the dynamo when the train is running at an abnormally great speed. The accumulator or store being always kept full or well filled, a light can therefore be obtained while the dynamo is not at work, and without the necessity of the engine being attached to the train. The only attention that is required is at the terminus, when the brushes of the dynamo have to be looked at to see that they have preserved their proper angle. During the day-time, when the light is only needed when passing through a tunnel, the guard can, by turning the handle or lever of a simple switch, put the light on, and by reversing the lever it can be shut off. At night, when a constant light is wanted, the switch is kept on continuously, and the accumulator and dynamo working in conjunction supply the current. Another important feature of the apparatus is that it is automatically reversible, and consequently works no matter in which direction the train is going.

The installation itself comprises a specially modified form of Brush dynamo, a storage battery consisting of twenty of the Electrical Power Storage Company's cells, and the automatic apparatus, the whole being fitted in a portion of the guard's brake van. The connections between the carriages are so constructed that they can easily be uncoupled, and in slip carriages will be so automatically. Two trains on the Brighton line have been fitted up on this system, a local and an express train. The local train commenced running on November 29, 1883, and has worked without cessation ever since. During the foggy weather the light was often burning from two or three o'clock in the afternoon until midnight, and we are informed that there has never been a failure at any time. The express train which has been newly fitted up is so arranged that there are two lights to each compartment, to prevent the possibility of a compartment being left in the dark owing to the breakage of a lamp. The present lamp glasses and holes in the roof of the carriage are also utilized, and the electric lamps may be removed and replaced by a man on the roof quite readily. Altogether the plan appears to be a success, and to present the best solution to the question of train lighting by electricity that has yet been advanced.—*Iron.*

Western Railway Club—Locomotive Tires.

At a meeting of the Club, held in Chicago, Sept. 17, the subject of Locomotive Tires was taken up.

Mr. Geo. W. Stevens said the wear of tires began when the engine left the shop, and the object should be to increase the wear and lessen the repairs. He would like, in this matter, to have a full interchange of views. He believed that the makers of tires ought to give a guarantee for them just the same as the makers of cast wheels do. The latter, he said, have increased in efficiency fully 25 per cent. since a guarantee went with them, and it was not at all unreasonable to suppose that a similar result was possible with steel tires.

Mr. Prescott agreed with Mr. Stevens regarding guarantee. He said that the life of cast-iron wheels had been increased mainly by the use of better iron, and the same should be done with tires—better steel used. He thought that the difference in machines by which tires were put on had something to do with their life, and he himself had made considerable change in the proper counterbalancing of engines. Steel tires are becoming more largely used, and they would consequently be benefited by a guarantee.

Mr. Forsyth thought the subject of guarantee was a practical one. In the first place, however, correct records of mileage must be kept so as to be able to find out what service may reasonably be expected from tires. There were a number of conditions which affected tires, and he enumerated them as follows: weight on them, shape, what particular service employed on, and fourth, the hardness. The weight and service, he thought, might be regarded as one condition. As regards guarantee he said that the Midvale Steel Company had stated their willingness to furnish tires for different kinds of service, but he was in doubt as to whether there was a sufficient number of sustained facts to enable them to put different tires to different uses. Thought that only one or two roads in the country kept a correct tire record. The reason of this is that tires are measured by diameter. A better way of measuring tires was to measure the circumference and a still better way was to weigh the tires. The value we get out of tires is the weight when they are new, less the weight when they are worn, divided by the mileage. That is what we are paying for, the amount that is worn off. If we are going to ask for a guarantee for tires, the railroad companies must get to work and keep a correct record, and it is a question how the measurement showing the record should be taken. The next thing was their hardness. Was not aware of any difference between the American and foreign tire in this respect. There was certainly some difference in the quality between the Krupp and American. Some Western roads preferred the foreign tire. He thought that it was the same as with steel rails. Every one would prefer, of course, to buy a rail that gave better wear even at a higher price than the cheaper one which would not last as long. The shape of the tire has an important influence on the wear, and he did not know how many Western roads had taken up the question of taper.

Mr. Lewis believed that it was important that the names of manufacturers be given, so as to be able to determine the relative merits of the different tires. We know that there is a great difference in the hardness of tires made by different manufacturers, and so far as we can get this information, it will enable us to judge whether there is anything in that particular quality of tire. It is frequently the case that tires from the same manufacturers vary. Of course, the conditions in which a tire is worn are very important and should be considered. A tire on a heavy passenger train would not wear so long, of course, as a tire on a light passenger train.

The subject was continued to enable members to obtain statistics as to wear of tires, etc.—*Railway Review.*

Car Building in Alabama.

The town of Anniston, in Northern Alabama, is a striking illustration of the industrial progress that is being made at the South. Ten years ago the site of the town was a cotton field, and now the manufactories already established there give employment to 4,000 people whose earnings aggregate $60,000 per month. Among other enterprises that have had a rapid and prosperous growth, are the works of the Anniston Car Company, which are the largest of their kind south of the Potomac. The plant was originally located as Cartersville, Ga., but was removed to Anniston a little more than a year ago, where the works have been reconstructed on an enlarged scale by the present company, of which E. L. Tyler is President, C. T. Watson Secretary and Treasurer, and C. E. Lucas, Superintendent. Mr. Lucas is the original patentee of the Lucas sleeping car. He is one of the wide awake men of the South, a thorough mechanic and an able manager, under whose direction the company has achieved a grand success.

The main building is 90 × 300 feet; five working sheds are 40 × 250 feet, and a two-story coach shed is 42 × 250 feet. Sash, door and blind manufacturing is also extensively carried on, doing work for the whole of the surrounding country. They are supplying a large order for the new hotel, consisting of balustrade, paneling, etc. This department of the company's business is very rapidly increasing. The machinery in use is all of the newest description and most improved patterns. The company manufacture all kinds of railroad cars, but mostly the various kinds of freight cars. Preparations are now being made for building passenger coaches on an extensive scale. Their present capacity is five freight cars a day. The facilities for handling cars and material are most complete. For loading narrow-gauge cars on broad-gauge ones for shipment to the roads on which they are to be used, a most simple but excellent contrivance has been made. The narrow-gauge cars are run on a track to suit them to the top of a bank level with a broad-gauge car on a broad-gauge track, to which they are easily transferred. All the lumber used is kiln dried. The average force of men employed is 150. The works are connected by trams to the car wheel works, and switches run into the yard from all the railroads centering at Anniston.

The Anniston Car Wheel Works comprise a two story brick machine shop, 50 × 150 feet, a foundry 84 × 335 feet, and the forge, 80 × 215 feet. These works are the largest of the kind in the South, and are turning out 200 car wheels per day. The wheels are manufactured of the charcoal iron produced at the Anniston and Clifton furnaces. It is unsurpassed for car wheel purposes; is strong, and of good chilling properties. The wheels are all guaranteed for 50,000 miles, and many of them run 150,000 miles. They are in use by most of the principal railroads in the South. The above is condensed from the Birmingham (Ala.) *Daily Age.*

The Philadelphia Electrical Exhibition.

The Exhibition, although on a somewhat smaller scale than those at Paris and Vienna, is, nevertheless, in the number and quality of the exhibits in the highest degree creditable to this country, as showing the progress of electrical science in its various applications in the wide field of utility. Although it is called an international exhibition, there is little in the display to justify the name, the foreign exhibits being few and far between. Their absence, however, is not particularly noticeable in view of the splendid and almost bewildering display of the products of American genius. In respect to the electric illumination, it is safe to say that no large building in this country was ever before half as brilliantly lighted as this. The roof of the main building has nine rows of arc lights or 100 lights in all, the effect of which is to turn night into day. The exhibits everywhere blaze with light from arc and incandescent burners, filling every nook and corner with a splendor like noonday. The interest of the scene is enhanced by a fountain in the center of the main building. At times the roof lights are extinguished for a few moments, and two brilliant arc head-lights are turned upon the spray of the fountain, producing a wonderful effect, especially when the light is transmitted through colored mediums, and the water tinted with aniline green.

We give elsewhere some account of the electro interlocking system of switches and signals on exhibition, and we now note a few other exhibits.

The Pratt & Whitney Co., of Hartford, exhibit a complete "comparator," with electric stops for the carriage and incandescent lamps for illuminating work under microscopes. They also exhibit some beautiful specimens of limit gauges for shop use, and a variety of standard reamers, a new article in their line, specially adapted for use in railway shops. They are made and relieved by machinery, and have no hand-work upon them. The accuracy and perfection of the measuring instruments of this company are so well known as to need no special mention.

Mr. Benson Bidwell, of Philadelphia exhibits a car operated by an electro-motor. The apparatus consists of two brass pipes or conductors placed inside of a pair of wood guard-rails. Under these conductors the brushes make the contacts in such a way that the conductors are protected from accidental contacts.

The exhibits of the great electrical companies superbly illustrate every branch of electrical science. The Brush company has some storage batteries which are interesting and give excellent promise. The Weston company shows some examples of transmission of power by means of dynamos, that are quite remarkable. With a proper plant, the loss in transmission can be made as low as 10 per cent. in each machine, and the experiments show that in a commercial way 80 per cent. of the power expended in driving the first dynamo can be transmitted.

Mr. F. B. Sturtevant, of Boston, has a steam blower at work in the building which discharges 2,400,000 cubic feet of air per hour. With respect to steam engines which furnish motive power for the exhibition, the Porter-Allen, Westinghouse, Ball, Straight Line, Buckeye and New York Safety Steam Power Co. are all represented.

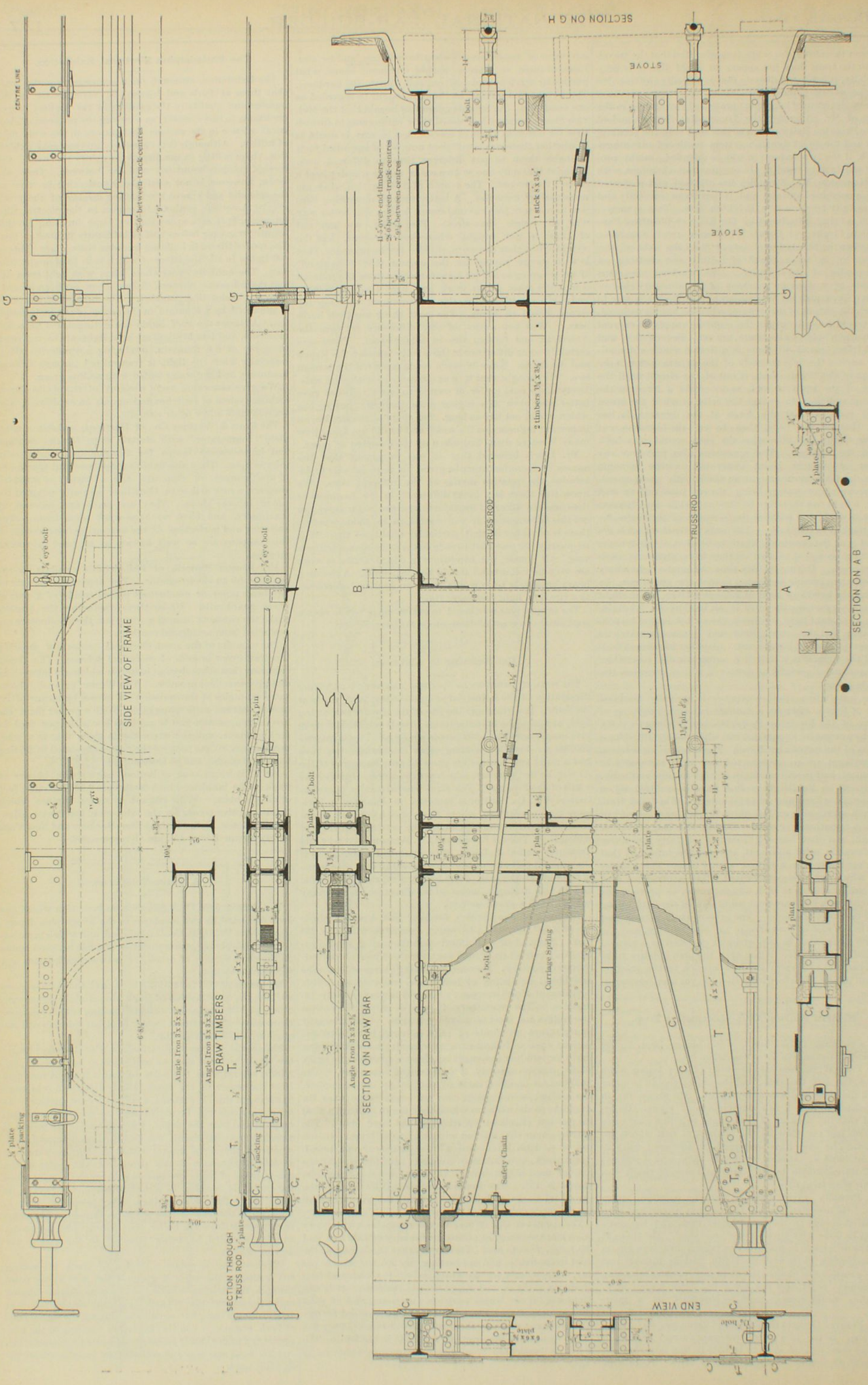
A Train Telephone.

The Detroit *Free Press* describes an invention which has been perfected by two employés in the telegraphic department of the Michigan Central railroad, and which promises to make telephonic communication possible between trains on the same section of track, or between such trains and the nearest station.

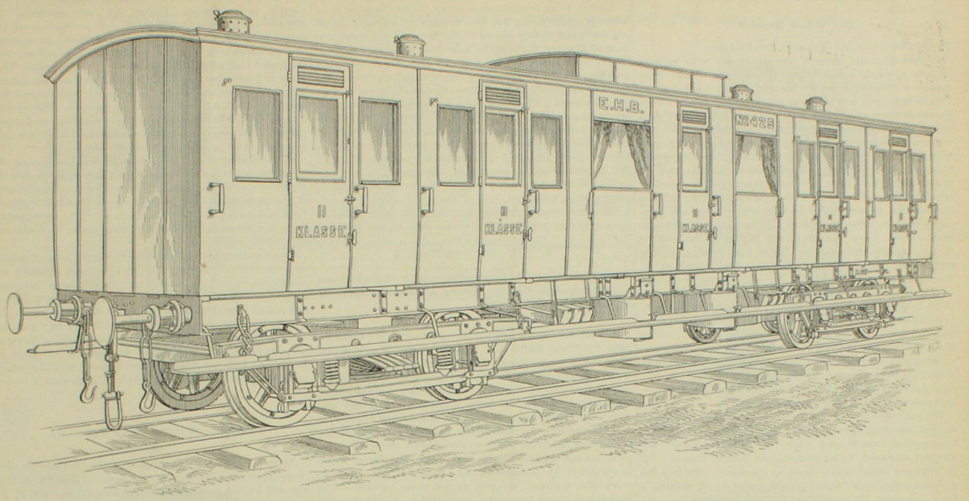
By means of this invention, it is said that two engines striking the same section of track immediately signal each other, and the engineers without slacking speed, can communicate, or the station master at either side can call the engineer and talk with him.

The means of communication is a wire stretched beside the track between stations and open at each end. The wire is set out from the poles so that it is about four feet from the center of the track, and is upheld on insulators so arranged that it presents a perfectly even surface. At the station this wire is carried back around the switches on poles and into the depot, where it ends. By means of a push-button its circuit can be closed on a ground wire, whenever the depot master wishes it. On this wire rests an arm swung on a double pivot from the center of the cab, capable of being reversed so as to touch the wire when the engine is running in either direction, and held to its place by coiled wire springs. The telephone wire is attached to the base of this rod, runs through a generator run by steam from the boiler, then through the telephone, and is grounded by being attached to the axle of the driving wheels.

When an engine enters a section of track, the sliding rod resting on the wire, it grounds the wire at one point through the driving wheels. As soon as another engine enters the same section of track it also grounds the wire, thus establishing a complete circuit and ringing the signal bells of both engines, when the engineers can step to the telephone and immediately ascertain each other's whereabouts. Neither head nor rear end collisons are possible where the signal is used.


CENTRE LINE
SIDE VIEW OF FRAME
28'-6" between truck centres
7'-9"
⅞" eye bolt
"a"
DRAW TIMBERS
Angle Iron 3"x3"x½"
SECTION THROUGH TRUSS ROD
½" plate
½" packing
SECTION ON DRAW BAR
⅞" bolt
41'-3" over end timbers
28'-6" between truck centres
7'-9¼" between centres
G
H
B
A
SECTION ON G H
STOVE
TRUSS ROD
1 stick 8"x3½"
2 timbers 1¾"x3½"
J
T
C
Carriage Spring
Safety Chain
½" plate
END VIEW
SECTION ON A B

SECOND CLASS PASSENGER CAR. BUILT AT SKABO CAR WORKS, CHRISTIANIA, NORWAY.



SECOND CLASS PASSENGER CAR, BUILT AT SKABO CAR WORKS, CHRISTIANIA, NORWAY.

We herewith give a perspective view and details of iron under-frame of a passenger car built at the Skabo Car Works, in Christiania, Norway. In its proportions, its system of compartments and general features, it does not differ materially from other cars of its class on European railways, and consequently will not be regarded as a model for imitation in this country, even in case the predicted advent of iron cars in passenger equipment should at some future time be realized. Some useful hints may be obtained, however, from an examination of the details of construction, as shown in the engravings, the exterior view being an imperfect reproduction from a photograph of superior excellence, and the framing from a blue print, the equal of which in clearness of outline and graphical delineation we have seldom seen.

The length of the car body, over all, is 41 ft. 6 in.; width, 8 ft. 6 in.; height above floor, 7 ft. 2 in. The outside of the body is sheathed with sheet iron. There are five compartments with 24-in. side doors. The central one is 13 ft. 6 in. long, and the others 6 ft. 9 in. The windows are respectively 26 × 36, 24 × 26 and 15 × 26, and have two glasses in each sash. The total seating capacity is 52. The inside finish is in oak and whitewood. The central saloon chairs are upholstered in cherry plush, and those of the smaller compartments in blue cloth. The floor is double and the intermediate space filled with sawdust. The heating is by coke stoves, placed underneath, as shown, the apparatus for distributing and regulating the heat being too complicated to be described in detail. The trucks are of American pattern, with 36-in. steel-tired wheels and French's elliptic and coil springs. The total weight of car is 17 tons.

The essential part of the floor frame consists of two deep I-beam side sills, united by transoms of a box girder shape. A separate system of framing connects the channel iron end sills with the transoms, the side sills being the only ones that continue the whole length of the car. The intermediate sills are composite, and extend between the bolsters only. This special form of framing appears to be due largely to the method of constructing the upper part of the carriage, and to the fact that the buffing is done at the sides, and not at the center. The side sills consist, as we have said, of two I-beams, which are 9¼ inches deep, with flanges 3¾ inches, and weigh about 20 pounds per foot. Between the bolsters they are strengthened by cross connections, at distances of about 5 feet. Beyond the bolsters they project about 6 feet. The connections with them are, in almost every case, made with ¾ rivets. In all cases, except at the corners where they are riveted to the end sill, one or more angle irons are worked into the corners. In addition to the angle irons, plates are riveted upon the flanges, both above and below, for the purpose of securing increased stiffness.

The way in which the truss rods are applied is entirely different from any thing to be found in American cars. As will be seen in the plan, the truss rod T_2 extends only from bolster to bolster in the usual way, and at a distance of 15½ inches from the side sills. At this point it is fastened by a 1¾-inch pin to an eye attached to a diagonal plate T, which lies on top of the transom and extends to the corner of the frame, where it is secured to the corner plate by a pair of plates T_3, which are riveted to both. The eye is formed by two ½-inch plates riveted upon the diagonal with ¾-inch rivets. The diagonal plate T is 4 inches wide and ¾ of an inch thick. It is secured to the plates T_3 by three ¾-inch rivets. The section through the truss rod shows the method in which the corner connection is made. The corner plate C is ½ an inch thick, and a ¾-inch packing piece is introduced underneath it to make it flush with T. In the end view a section is shown giving the position of these plates.

This disposition of the metal makes the upper corner very secure, but this is not all. Beneath the side and end sills, a plate C_2 is worked against them with ¾ rivets in the end sill flange, and ⅝ rivets in the side sill. This is shown at C_2 in the plan and an edge view in the section through the truss rod. This plate has four rivets through the end sill. In order still further to strenthen the corner, two short pieces of angle iron C_4 are worked in between the flanges of the end sill, to which they and the side sill are riveted. A diagonal brace C_5 in the plan, and shown in section in the end view and elevation of the bolster transom, also adds strength to the corner, to which it is secured by the angle iron C_3. This angle comes behind the casting, through which the stem of the buffer passes. Bearing in mind that the webs of the side and end sill are about ½ an inch in thickness, and that the angle irons are the same, while the top and bottom plates vary from ¾ to ½ inch, it is readily seen that the corner of this car frame possesses far greater strength than has ever been considered necessary in this country in putting up a metallic frame. Very few tender-frames even have any approach to this rigidity at the corners. It is evident that the designers intended that when the corner was once in place it should hold its shape in spite of any shocks it might receive. The diagonal brace C_5 consists of two 3 × 3 inch angle irons ⅝ inch thick, with their horizontal sides toward each other. They are separated by a space of 2½ inches, and form a spring pocket for the half elliptic buffer spring, which is 4 feet 11¼ inches between the bearings. In order to secure sufficient space for this spring, the ends of the angle irons have to be bent.

The bolster takes the form of a box girder. It is composed of two I beams, each 9¼ inches deep, with 3¾ inch flanges. The amount of strength obtained by this construction is far greater than that given by any form of iron body bolsters now in use. Its form is clearly shown in the section through the draw bar. The top plate is ¾ of an inch thick. The bottom one is ½ inch; ⅝-inch rivets through the flanges secure the whole, making a very strong piece of work at this point. In addition to this, angle irons are worked upon both sides for the purpose of securing the diagonal braces, draw-bar irons, and the center sills. The ends are secured to the side sills by four angle irons D D, held by ¾-inch rivets. Near each end of the transom there are heavy plates on top and bottom, one of which is a stay for the truss rods and the other a brace upon the bottom. Except for convenience of reaching certain parts, this transom might have been made with a continuous plate, top and bottom. Certainly its strength is but little less than it would have been if so constructed.

The center sills are missing except between the bolsters and the car ends, where they take the place of draw-timbers. The intermediate sills are not continuous, but extend only from one bolster to the other. The forward portions J J are double, and of 3½ × 3½-inch stuff separated by a ½-inch space to allow the rods which connect the buffer springs to pass through them. Between the needle beams the intermediate sills are of single sticks 3½ inches by 8. The needle-beams are replaced by channel irons which cross the frame between the side sills, cutting off the intermediates. These are held in place by bolts and angle iron pockets. The channel iron is 8 inches deep, with 3-inch flanges, and carries the castings and studs which hold the truss rods. There are some advantages in bringing the needle-beam from a position below the sills to a level with them, as the bottom of the frame can then be made flush from end to end. There are many points in connection with the car frame which are exceedingly ingenious, but which would interest the American designer slightly, on account of radical differences in design between cars built abroad and in this country. We have mentioned most of these points which are likely to be useful, and leave the reader to study the drawings for further details.

A Theory of Lubrication.

Walter R. Brown, an English investigator of some note, writes to the *Engineer* as follows:

Certain theoretical conclusions as to the nature of friction in the case of lubricated surfaces may perhaps be deduced. We may assume that the surface of the journal and bearing are divided from each other by a film of oil sufficiently thick to prevent their coming in contact; that this film is divided into two rings, one adhering to the moving journal, the other to the stationary bearing; and that the resistances, here called by the name of friction, are really those which occur at the bounding surface where these two rings meet each other. This is, in fact, a conclusion to which engineers have generally come from practical experience; and it is confirmed by a curious fact which occurred in the course of Mr. Tower's experiments. It was found that when a small hole was drilled down from above, through the brass bearing on which the load rested, the oil rose in this hole, and could not be kept from doing so, except by the application of a very great pressure—more than 200 lbs. per square inch in that particular case. This proves the existence at the point of greatest pressure between journal and bearing, of a film of oil capable of sustaining that pressure, and of being slowly squeezed out by it where an opening presented itself. It is clear that this film can not be wholly at rest, but must be recruited from the oil bath below through the action of the rotating journal; otherwise the film would almost immediately have been squeezed out, and thus the whole of the journal would have become dry and would have seized.

We are therefore justified in assuming that there is, in the case of a completely lubricated journal, such as we are considering, a film of oil adhering to the outside of the journal, and another film adhering to the inside of the bearing. These two films are constantly sliding or shearing one past the other at the surface speed, whatever that may be, of the journal.

Communications.

Car Wheel Repairs.

To the Editor of the National Car-Builder ;

Considering the present manipulations with railway wheels of every construction, including new and worn wheels withdrawn from service, the situation is becoming troublesome and one of great importance. Being aware that to produce good results great care should be exercised that every wheel is properly located when held for boring, as regards concentricity, true with flange, and above all, each wheel comprising a pair of exact diameter, to assist ease of motion to car body, least disintegration to rails, and especially wheels. If put in service otherwise, the smaller wheel of the pair is forced with flange against the rails, as the smaller cannot make the same distance at each revolution that its larger mate does. If by chance it remains on the track, there is a continued sliding of the smaller wheel, rapidly reducing its flange and tread, while the larger mate cannot get its flange to partially assist in directing its share as intended. We have proof every day of this evil, and while the number increases, vexatious repairs multiply rapidly. It becomes imperative at every few thousand miles to withdraw such worn wheels from service, if only to guard against danger, as they are apt to leave the track at any slight defect so common to the permanent way. While, on the other hand, wheels accurately paired are not so destructive to flanges, retaining the correct standard much longer, avoiding many derailments, and much loss to property and life.

We remove worn wheels from service, apply gauge to flanges, deciding approximately the amount to be cut from the smallest, thin-flanged wheel, in order to restore the adopted standard. In many instances we find its mate, the full-flanged wheel, much larger in diameter. We find the adopted gauge over flanges or flange destroyed, making a long, expensive job in reducing, in order to restore the worn flange. On this account we unhesitatingly and willfully cut away its good mate to accommodate the other ruined in service. For every turning of steel tired wheels, more on an average is cut away than worn away while in service, being expensive and wasteful to extremes which no one can deny.

Admitting the many advantages derived from larger wheels in passenger service, unfortunately at the present time making it practicable only to use wheels built up for safety, depriving them of that essential and valuable portion that serves to make any wheel serviceable and desirable, as it would be with a good, hard flange ; while this waste is not all due to any particular construction of wheel, but in greater part to oversight in repair shops, some adhering to extreme coning. This baffles the best of mechanics to determine sensitively a pair of exact diameter, being measured while in the lathe and not easy of access, when the slightest difference from flange if taken diametrically is misleading; when removed from lathe supposed to be correct, in many instances was found one larger than the other, not true with journals, neither were they true at flanges. This invited close watching, and proved conclusively the destructive workings of the larger over the smaller.

We attribute these rapid reductions chiefly to the way wheels are handled. Since testing many pairs, we are fully convinced it is impracticable to true large wheels, say 42 inches diameter, on a light, yielding axle, being very troublesome if wheels are hard; while the lathe may be one of the best, very solid and positive, it matters not how strong and well-proportioned the tool may be, the axle not being rigid enough in proportion to the strain upon it, the capacity of the tool is limited. Master Mechanic.

Wrought and Cast Iron in Brake Shoes.

To the Editor of the National Car-Builder :

There is great diversity of opinion among railway men about the patterns of brake shoes, the kind of metal of which they should be made, and the methods of fastening. That this is so, is evident from the fact that committees of the Car-Builders' Association have had the subject in hand for years past without any very definite results as to the comparative merits of cast and wrought iron when used exclusively, or not in combination.

Without attempting to decide the question as between the two metals, I desire to offer a few suggestions in regard to the quality of the materials that should be used in the Congdon shoe, in order to realize the full benefit of its particular construction, which consists of alternate sections of cast and wrought iron. In the making of these shoes it is highly essential that a poor quality of wrought iron should not be used, much less miscellaneous wrought scrap. As wrought iron most quickly exerts a retarding force when applied to the tread of a revolving wheel, less power is required in applying brakes, and therefore there is less grinding and destruction of the metal surfaces. But this applies only to new wrought iron shoes. The wrought iron soon becomes case-hardened, and, as such, is destructive and detrimental, and upon this is founded the objection to the wrought-iron shoe.

Now, if in constructing a shoe of both wrought and cast iron, a part of the wrought iron has, by some former service become case-hardened, it will be injurious to the tread of the wheel upon which it is used, and herein lies the danger of using miscellaneous scrap. The Congdon shoe, when properly made, has the sections of wrought metal regularly and evenly placed in the body of the shoe, and instead of scrap, it should be new homogeneous bar iron. The result is that the worn particles of cast iron constantly passing over the surfaces of wrought metal, cut these surfaces down evenly and give them no opportunity to become case-hardened. There is a right and a wrong way of making these shoes, and the unqualified satisfaction that the Congdon shoes have given the Pullman Co. and others, in their use on steel-tired wheels, is the result of their having been properly made at foundries having suitable facilities, and by parties who appreciate the importance of this care in construction to which I have referred. When properly put together, therefore, and of the right quality of material, a combination of wrought and cast iron makes as good a bearing surface for a brake shoe as has yet been devised. D.

The Westinghouse Electro-Pneumatic Interlocking Switch and Signal System at the Philadelphia Electrical Exhibition.

Among the many interesting exhibits at the Philadelphia Electrical Exhibition, is that of the Westinghouse Electro-Pneumatic Interlocking Switch and Signal System, of which the Union Switch & Signal Co., of Pittsburgh, are the exhibitors. By this system, the application of electricity to railway operation is illustrated in a way that demonstrates its utility in the most convincing manner, as well as the effectiveness of the apparatus by which the mysterious agent is made serviceable in the working of switches and signals. The power for working the switches is furnished by compressed air, which is also made to work the distance, as well as the home signals. The switch and signal levers are controlled by electricity, and are mechanically interlocked so as to govern the work of the operator and prevent him from making wrong signals or moving wrong switches. The system not only performs the manual labor, but it also acts as an inspector upon the operator, and at the same time goes still further and compels him to work in the manner which has been predetermined, no other course being left open to him.

In the signal tower, the apparatus necessary to work the four switches required for a grade crossing of two tracks, is contained in a space of 12 inches square, and of about the same height. There are two levers for the movement of the switches, and two others to set both the home and distance signals. These levers are about 8 inches long and can be worked by two fingers of the hand. By this system, and the use of open switches in front of the trains, it becomes mechanically impossible for a train collision to occur. The 4 small levers take the place of from 12 to 16 levers which are needed to do the same work by the Saxby-Farmer or any other system of mechanical locking ; and while they are easily worked, they have the additional advantage that the switches can be moved with a rapidity that is entirely out of the question with hand-power. Five of them can be moved in six seconds. The signals are worked with equal rapidity. To realize the gain, it is only necessary to note the time occupied in handling any switch by hand, and compare it with the figures here given.

Some of the points in the working details are very striking. In front of the operator is a moving diagram of the track with the switches. Upon setting one set of switches for the passage of a train, and also the signals to allow the train to proceed, the apparatus locks itself, and nothing further can be done on the set of levers controlling these tracks, or the others, until the electric signal given by the passage of the train unlocks them. This prevents accidents occurring from absence of mind in the operator, and which has caused switches to be moved while trains were passing.

The system, as we have said, is worked by compressed air. Ordinarily a Westinghouse air-pump is used, where the work to be done is within its capacity, but a Norwalk compressor is required at points where there are many switches and much work to be done. A pressure of 7 pounds per square inch will move the switches, but to operate the signals, 35 pounds is required, for the reason that they are counter-weighted so as to remain always at "danger," unless put to "safety" by force. Any interruption in the working of the air-pipes or electric signals leaves the whole system at "danger" and stops the working of all parts of the apparatus.

Another interesting portion of the exhibit consists of a circuit of double track, with road crossings, switches, etc., arranged so as to fairly represent several sections of track with all the signals. The signals and signal posts are the same as used in actual practice, being full size, and placed in proper position relative to the model track. On this track a model engine is used to represent the train and show the working of the apparatus. This arrangement has the advantage of showing the visitor the time required for full-sized signals to work, as well as illustrating the details of their construction and setting. It is called an automatic electric rail circuit block signaling system. The rails themselves are used as conductors, which, while it diminishes expense, provides a constant indication of the condition of the track, and enables broken rails to set danger signals. The normal position of the signals is at danger. Failure of the apparatus in any part, produces a danger signal and prevents a safety signal from being accidentally or intentionally given until the apparatus is in working condition. Atmospheric influences do not affect the operation of the signals. The work of protecting the blocks is automatic, and the safety signals are produced only by a power which must be maintained as long as the signal is exposed. The safety signals cannot be operated nor exposed as long as danger exists. The apparatus is not complicated even for the signaling of an entire block of double-track road.

In the exhibit means are at hand for illustrating all these points in very satisfactory practical methods, which are more convincing than any description can be. A study of the apparatus can be made even to better advantage than in a track yard or on the road, as it is more compact, and the model trains can be run so as to illustrate all possible conditions.

This company also exhibit the Stanley system of incandescent electric lighting for stations and signals ; an electric locking for mechanical interlocking systems, making it impossible to give a clear signal until the train has passed ; the pneumatic rail circuit block system, made automatic both for single and double tracks ; and the Hanby electric slot signal, which is cleared by the operator for a train to pass, is put to "danger" by the train in passing it, and can not be again cleared until the whole train has passed the next telegraph or block station.

Painting Passenger Cars Piecemeal.

At the recent convention of the Master Car-Painters, Association, Mr. Murphy, of the firm of Murphy & Co., the well-known varnish manufacturers, of Newark, N. J., suggested that passenger cars should be painted both inside and out before they are put together, in order to give the paint a longer time to dry and so insure better and more durable work. If the carpenters would only furnish the painters with the wood, it could be painted, and there would be plenty of time for the paint to dry. The thing had been done and could be done again. If there was an objection on account of the nails, the panels could be put in with glue and be all the better for it. He had been informed that the Pullman works, at Chicago, had already adopted the plan. The painters would, of course, kick against it, because they would have to do the work better than they had been doing it.

The suggestion was not favorably received by the car-painters of the convention, judging from the brief remarks that were elicited. Mr. Hartshorn, of the Maine Central, who had just read a paper setting forth the need of more time to make a good job, raised the point that the outside and inside of a car were two very different things, and that most of the wear was on the outside. The inside and outside could not be painted alike, or in the same way. Another member doubted whether the plan suggested by Mr. Murphy could be made to work, and also whether the master car-builders would be inclined to give it their approval.

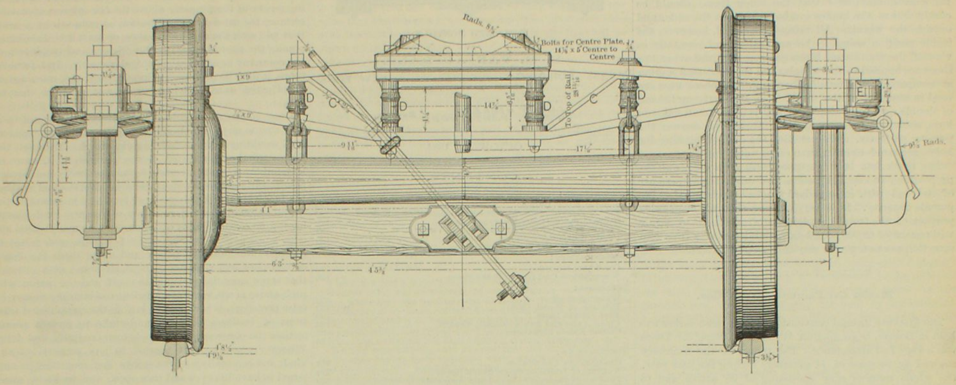
Mr. F. D. Adams, the Master Car-Builder of the Boston & Albany road, being present, was called upon for his views. He said the plan proposed was a new one. He had never heard it suggested before by anybody, but it struck him very favorably, nevertheless. He was not disposed to kick at it all. The panels certainly could be painted separately, and with the exception of the letter-boards, he could see no objection to painting the entire car before setting it up.

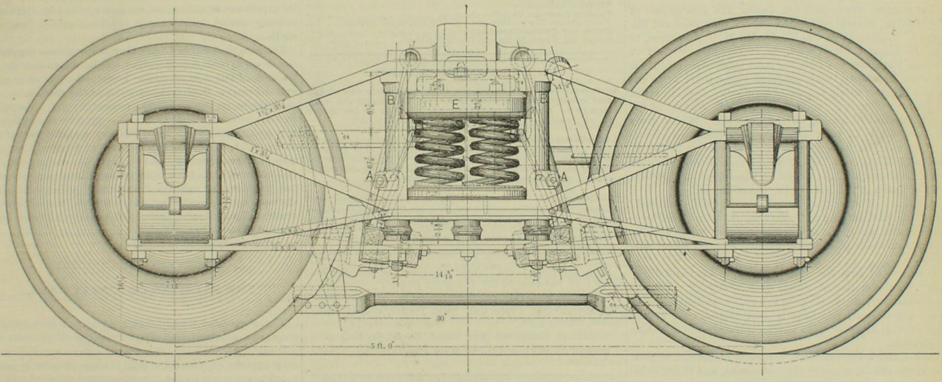
The convention then decided that the matter be formally brought to the attention of the master car-builders of the several roads, and the Secretary of the Association was directed to prepare a circular to that effect.

The responses to these circulars will probably show that so far as the inside finish of cars is concerned, a great deal of it can be done, and is done already, in the way proposed. But in regard to the outside, there will be obstacles in the way that are not easily overcome. If any portion of the outside can be fully painted before the car is put together, it must be the panels. These must either be nailed, screwed or glued to their places, and there are not many car-builders who would trust to glue alone. Nails or screws necessitate puttying. There would also be holes that would have to be plugged or puttied, to say nothing of imperfect joints that would need dressing and smoothing so that the finished surface would be uniform in appearance and free from blemish.

The Cummer Engine Co., of Cleveland, report that they are building three large refrigerating machines for Joseph Hensler, of Newark, N. J., and that their orders are still on the increase, including one for a 300 h. p. engine, to supply motive power for the shops of the West Shore road, at Frankfort, N. Y. They have also just shipped an engine to the Pennsylvania Co.'s shops at Indianapolis, Ind. Orders are also in hand for a 170 h. p. engine for the Hadley Cotton Mills, Holyoke, Mass. ; a 130 h. p. engine with outfit complete, for the Upton Mfg. Co., Battle Creek, Mich ; and two 70 h. p. engines for the Citizen's El St. Co., Akron, O. Cummer engines have also just been started at the Louisville Exposition, the St. Louis Exposition, and the flour mills of Cheesman & Driesbach, Tonganoxie, Kansas.

PROPOSED STANDARD TRUCK FOR FREIGHT CARS OF 60,000 POUNDS CAPACITY—LEHIGH VALLEY RAILROAD.





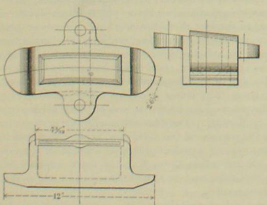


Fig. 1.

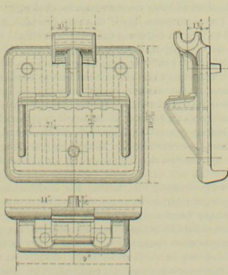


Fig. 3.

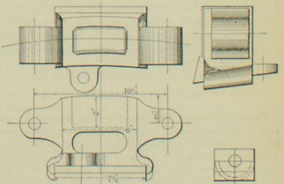


Fig. 2.

This truck was designed by Mr. John S. Lentz, the Master Car-Builder of the road, and aside from the necessary modifications required by the increased load to be carried, does not differ materially from the standard truck of the road for cars of 40,000 pounds capacity. It is of the diamond pattern, with a 5-foot iron bolster, channel iron spring-plank, and 33-inch wheels with inside brakes. The arch-bars are 3½ inches wide, the upper one is 1½ in., the second or inverted bar 1 in., the auxiliary bar ¾ in., and the pedestal tie-bars ½ in. in thickness. The pedestal bolts are ⅞ in. in diameter; the bolts through the guide pillars *B B* are 1⅛ in., and have large heads for the purpose of securing greater strength at the point where the ordinary diamond truck breaks down under an excessive load. The form of the side truss has some advantages over other and simpler forms. The peculiar feature of the truck is the method for obtaining stiffness in the transom, as shown in the end view. This transom is composed of two arch-bars 9 inches wide, the upper one 1 in., and the lower one ⅞ in. thick, stiffened by the braces *C C* and the struts or distance-pieces *D D*. The center-plate has a cup bearing with 8⅝ in. radius. The ends of the bolster are held by a peculiar-shaped casting *E*, which forms the spring pocket. Two ⅞-in. bolts pass through the casting and secure the bolster ends.

Fig. 1 shows plan and elevation of the side-bearing casting, also an end view showing the angle of bearing surface. Fig. 2 shows lower bearing and bracket for brake hanger, and is a neat and very good form. Fig. 3 is a casting used for a truss rod saddle, a transom socket, and a kind of pocket for the side sills. It makes a very secure connection with the sills without cutting into them, give a firm saddle for the truss rod, and holds the bolster so as to make it an integral portion of the frame.

The means for holding the truck square are worthy of notice. As there are no channel bar connections of the usual kind, and as the spring plank, which is only 4 inches in width, does not add much to the diagonal stiffness of the truck, the desired effect is secured by two ⅞-inch diagonal rods *A A*, which connect the opposite guide bars, and are nearly on a line with the center of the journals. These rods are equivalent to corner-ties to hold the sides square.

Many car-builders object to hanging the brakes between the wheels, and prefer that the truck frame should be continuous so the brakes can be hung from the ends, and outside the wheels. All things considered, however, the inside position seems to be preferable, and especially in view of the diminished leverage upon the truck when the shoes are applied to the wheels, and the decreased motion as compared with outside hanging. No check nuts are used in any part of the truck. The road gave up the use of double nuts some time ago, and is using small flat iron keys, such as are shown at *F F*. These keys answer the purpose perfectly, and, including the cost of making the holes, are much cheaper than extra nuts.

The truck has been designed with great care, and the proportions and details determined from the experience of the road with its standard trucks under cars of 40,000 pounds capacity. It is very evident that a considerable portion of the freight equipment of our roads in future will consist of 60,000 pound cars, and designs for their construction are now under way in various quarters.

Master Car-Painters' Association.

The fifteenth annual convention of this association was held in Boston, beginning on Wednesday, Sept. 3. There was a very full attendance. The report of the secretary showed an increase of 14 members during the past year, the whole number now consisting of 95 active and 18 honorary members. The receipts for the year were $386 and the expenditures $102, leaving a balance on hand of $284.

The sessions were continued during the greater part of three days. Several interesting papers were read and discussed. Among these was one by Mr. D. D. Robertson, of the Michigan Central road, on "The Best Method of Testing Varnishes to secure the most satisfactory results as to their durability, with practical suggestions as to the time a car may safely remain in service before being taken in for revarnishing :" another by Mr. C. E. Phelps, of the Southeastern of Canada, on the question, "Which gives the best results in wear and travel, an elastic or a hard-drying color, on passenger cars?" and another by Mr. R. McKeon, of the New York, Pennsylvania & Ohio road, on the "Economy of Light Colors on Passenger Cars," which will be found in this issue of the Car-Builder.

A number of other topics were presented and discussed, including the best plan for removing old paint from locomotives and tanks; the best primer for iron work; and the various methods of cleaning painted and varnished surfaces.

It was voted that the best results as to wear and durability, in the matter of elastic or hard-drying colors on passenger cars, are obtained by the use of semi-elastic color coats throughout, and that a semi-elastic coat is one that dries in 24 hours with the temperature not less than 55 degrees.

It was decided to make the *Painters' Magazine*, of New York, the official organ of the association, and that a committee of three master car-painters be appointed to supervise all articles on car painting that may be published in it.

The following officers of the association were chosen for the ensuing year: President, John Rattenbury, Chicago, Rock Island & Pacific, Chicago; First Vice-President, F. S. Ball, Pennsylvania Railroad, Altoona, Pa.; Second Vice-President, A. P. Sweet, Detroit, Lansing & Northern, Ionia, Mich.; Secretary and Treasurer, R. McKeon, New York, Pennsylvania & Ohio, Kent, O.

The next annual meeting will be held at Montreal.

The most complete and comprehensive illustrated catalogue of railway and machinists' tools and supplies that we have ever seen has just been issued by Manning, Maxwell & Moore, 111 and 113 Liberty street, New York. The volume is very attractive in appearance, and in the character of its contents is a striking illustration of the progress that is being made in the perfecting of mechanical appliances of the various kinds and classes embraced in the catalogue. The book contains 660 pages, 8×11 inches in size, exclusive of margin, and is superbly printed upon delicately tinted fine calendered paper, which gives a clearness to the letter-press and engravings that is next to faultless. There are upwards of 4,000 admirably-executed wood engravings of uniform excellence. The arrangement throughout indicates the most painstaking care in elaborating the descriptive details, which are very complete and embody a mass of information, any particular of which can be readily referred to by means of the very copious index. To enumerate even in a general way the various classes of tools and appliances embraced in the volume would exceed the limits of a brief notice. Suffice to say that the collection includes the standard products of all, or nearly all, the well known machine manufacturers of the country, and will be useful for reference and as a valuable store of information for machinists and railway men. Each illustration is designated by a figure number, which should be referred to in ordering or making inquiries. A few pages at the end of the catalogue contain tables of weights, sizes, rules, recipes, etc.

The Marshall (Texas) Car Wheel & Foundry Works, recently destroyed by fire, will possibly be rebuilt at some other point in Texas. The machinery was a total loss.

NATIONAL CAR BUILDER

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EDITORIAL ANNOUNCEMENTS.

Addresses.—*Business letters should be addressed, and drafts and money orders made payable, to* The National Car-Builder. *Communications for the attention of the Editor should be addressed* Editor National Car-Builder.

Advertisements.—*Nothing will be inserted in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *The editorial department will contain our own views and opinions; and the rest of the reading matter, aside from advertisements, will be such as we consider of interest to our readers.*

Contributions.—*Articles relating to railway rolling stock construction and management, and kindred topics, by those who are practically acquainted with these subjects, are especially desired. Also early notice of changes in railroad officers, organizations and names of companies.*

Subscriptions *to the* Car-Builder *will be received, and copies kept for sale, at the following places :*

A. Williams & Co., 283 *Washington St., Boston, Mass.*

L. Schaffner, *Cigar and News Dealer, Grand Pacific Hotel, Chicago, Ill.*

Willie H. Gray, 306 *Olive Street, St. Louis, Mo.*

Robert Clarke & Co., 65 *West Fourth Street, Cincinnati, Ohio.*

WATERING STOCK.

Outside of intelligent business circles the most popular outcry against railway corporations is that of "watered" stock. The term has a flavor of sharp practice, and is understood to mean a fictitious increase of nominal capital in order to deceive the unwary and make dividends appear to be less than they really are; and the wonder is with many that such attempts to hoodwink the public are not prohibited by law. If the matter is carefully looked into, however, it will be found that stock watering, so-called, or the issuing of increased stock, is in itself a perfectly proper and legitimate proceeding inherent in the nature of corporate business enterprises, and that it only becomes an evil when it is resorted to for unworthy or fraudulent purposes.

A railway company has, within the limits of its charter the same legal right to increase the value of its property by legitimate earnings as a private individual has, otherwise there would be no inducement for the formation or chartering of such companies. Its earnings can be paid to its stockholders in cash or in stock dividends, or be expended for new construction, equipment or other needed improvements to increase the earning capacity of the property and make it more valuable. The earnings are not changed by making stock dividends, nor by the distribution of new stock *pro rata* among the holders of the original share certificates. The return to the stockholders is just the same, although rated at a smaller percentage on account of the increased share capital, which makes the total capital more accurately represent the value of the property. The stockholders being the owners are as much entitled to the gains from earnings or from appreciation of the property in value from other causes, as the thrifty farmer is to the increased value of his farm after expending years of labor in improving it. But if, as is claimed by some who aspire to be reformers, a railway company is not entitled to such gains, but only to a "fair interest on the investment"—the reformers being the judges as to what *is* a fair interest—the question arises as to what shall be done with the accumulated surplus, if any, after paying the interest. Must it lie idle beyond the reach and control of the stockholders, or be expended in improvements that can never increase the earning power of the property above the fair interest aforesaid, or must the rates of transportation be reduced to a scale that will sink the surplus in losses, or must it be distributed among the poor, or paid to the officers and employé's of the company as extra salaries and wages? And furthermore, it may be pertinent to inquire how the rates are to be adjusted so as to yield a fair interest, no more, nor no less.

There is, however, such a thing as increasing stock in a way that is unjustifiable and wrong, or the term "watering" would never have been applied to it. Although the share capital of a railway, or the increase of it, more or less, only represents a certain definite property and earning power, the road may nevertheless be overstocked so that the face value of the shares may be vastly in excess of the actual value of the property they represent. Such excess having no existing basis of value, and in many cases not even a prospective one, is purely ficticious, and is apt to mislead simple minded people and make them the dupes of sharpers and schemers. It is an abuse of a practice that is not essentially vicious in itself, and the reason why such abuse is not legally equivalent to obtaining money by false pretenses, is because the law in the complicated relations of business does not undertake to protect people against the consequences of their own credulity and folly. Whoever goes into the market to buy property of any kind, and especially railway stocks and securities, is supposed to have his eyes and ears open, and to know something of the nature and quality of the wares he is purchasing. If he invests unwisely and blindly he can only reproach himself for his own lack of judgment, and learn by experience that there are neceesary evils that can not be entirely abated until knaves and fools perish from the earth.

The idea that railway and other corporations for carrying on great business enterprises can be conducted on the basis of a "fair interest on the investment," is chimerical and visionary. Such organizations, in the absence of any restrictions in their charter, necessarily have the same right as private persons to earn money, buy and sell property and accumulate wealth, and any serious charter restriction of such right would be fatal to the end and purpose of their existence. This being their status, the capitalization of earnings and increased values can not, with any propriety, be called a "watering" process. It is important that a just distinction should be made between water and what is not water, and not apply a bad name indiscriminately to the right and wrong application of a principle that is good in itself.

THE PAINTING OF STREET CARS.

The September Car-Builder contained an article on street-car ornamentation copied from the *Blacksmith and Wheelwright*. We are informed by a street-car builder of long experience, that the article in some respects is calculated to convey a wrong impression, and especially in the statement that most cars on steam roads are rough-stuffed and rubbed, while such a thing is seldom thought of in a street-car shop.

It is claimed, we believe, by street-car builders, that as a rule street cars are much better painted than steam cars, and that in the best shops the work on street-car bodies almost equals carriage painting, while on the great trunk line roads, the rubbing process has been virtually abandoned, and the coats of paint follow one another with only such cleaning of moldings and corners as may be needed to keep them from being filled up. The varnish, even, is not flatted, and the final coat goes on and gives a gloss simply by flowing. The dust and cinders on a steam road destroy the surface of the varnish so rapidly that rubbing, in order to insure a perfect polish, is a waste of time and labor. On street lines the cars are no more exposed than private carriages, and on some lines not so much, as far as mud is concerned.

The method of painting at the car works of the John Stephenson Co., in New York, although not so elaborate as that of the New Haven carriage shops, is but little inferior. As soon as the posts and panels are in place, and before the roof is on, the outside receives a coat of "permanent wood filler." The next day it gets a coat of white lead without color, and then has one day to dry, and while drying it is puttied. The next coat is of Valentine's "rough stuff," which is followed 24 hours later by another coat of the same, and then the body is rubbed down until a smooth surface is obtained. Then follow from four to six coats of paint, the average number being five, the variation depending on the color that is to be applied, and the time allowed. These coats are all white, no matter what the body color is to be. With a white ground, the body may be of any color, so that a body that was intended to have a dark color, can at the last moment be changed to suit the whim of a customer or for other reasons. A coat of varnish is then applied to flatten on and letter. The lettering, which includes the striping and ornamental work on the outside panels, takes two days, the flattening included. If the car is to be a canary color it gets a coat of color and varnish for the flattening, which is merely to take the gloss off, and then two more coats of varnish, with an interval of 24 hours between, finish the car. Upon the sashes a coat of Wheeler's "wood filler" is applied and then the varnish. The rule is to give all cars these several coats, unless there is a pressure for less time on the part of the purchaser. One coat per day in all cases is the rule, except when time presses, and then a day or two can sometimes be gained in warm, drying weather. This system takes a week to the rubbing, during which all the rough work is done. Finishing will occupy about eleven days, including Sundays, or eighteen days in all. At present, the aim of all builders who have work to paint which is to be exposed to the weather the same as carriages, is to fill the wood in such a way as to make a solid foundation for the color, to put on no more color than is needed to give the proper effect, and when this is done the varnish is applied as protection and the work is considered finished.

With respect to the inside ornamentation of street cars, it may be said that the popular style of natural wood panels makes color work practically out of the question, the painting of flower pieces and other designs in color on these surfaces being a useless labor and productive of nothing worth looking at. Pleasing polychromatic decoration cannot be done on such backgrounds, which are suitable only for much simpler work. Much better and more striking effects are obtained from inlaying and similar methods. But in street cars inlaying is objectionable because it is more or less exposed to dampness and is liable to curl or strip from the panel, in which case repairing is difficult The plan adopted at the works of the above-named company, produces effects similar to inlay and which are as durable as the paint and varnish. Only a close inspection can discover the difference between this work and inlaid colored woods. The patterns are made by applying stains to the wood itself, and which are put on by means of rollers. As there is no limit to the color of the stains nor to the style of the patterns, the variety that can be obtained is also unlimited. The beauty of this style of decoration is very great, and so long as the rage for natural wood finish continues, it will undoubtedly hold a conspicuous place in street-car construction. Why it has not been applied to steam cars we are not prepared to say.

Many of the cars turned out of late by the Stephenson Co. are lettered entirely in nickel leaf, and on some of the cars of steam roads it has been used with good success. The leaf stands well so far, and the lettering is easily read in the night as well as in the daytime. It is not impaired by dust and dirt, and contrasts well with most of the darker colors. Having been used for this purpose only two or three years, its durability has not yet been put to the final test, but its record thus far is all that can be desired.

CRANK AXLES AND NON-AUTOMATIC BRAKES.

Railway managers in England, and the intelligent masses of the English people who desire safety as well as speed in railway travel, are beginning to realize the necessity of having brake appliances that will act in particular emergencies, independently of the engineer; and a distrust is also beginning to be felt as to whether inside cylinders and their necessary concomitant, crank axles, are infallible types of good construction. This increasing tendency towards the adoption of better and more advanced methods in the construction of passenger locomotives, and the exercise of an intelligent discrimination in the matter of brakes, is all the more encouraging from the fact that it does not proceed from mere abstract theories, but from actual demonstration of the most practical kind. With road-beds and tracks that seem to be as perfect as can be, and with every test known to mechanical science for determining the quality and strength of materials before subjecting them to the ordeal of service, there is, nevertheless, a liability to accident attended with such appalling results as the one which occurred on the Manchester, Sheffield & Lincolnshire Railway, and known as the Penistone accident. A searching inquiry into the causes was made by the Board of Trade, followed by a subsequent investigation by Major Mandarin, a thoroughly capable expert. In both cases the conclusion was reached that the primary cause was the breaking of a steel crank axle in which there was a flaw of such a nature that it could not be detected by ordinary inspection. In regard to this Mr. Mandarin says:

> "The giving way of a crank which is proved by the evidence and tests to have been properly made of steel of good quality, and to have been of strength and exceptional weight, and which had only run for a distance of 50,776 miles, should lead locomotive engineers to consider carefully the relative advantages of engines with inside cylinders and crank axles, as compared with engines with outside cylinders and straight axles; of steel axles as compared with iron axles; and of cranks hooped with wrought-iron bands, as compared with cranks having the additional strength provided by an increase of metal in the webs of the crank itself."

The secondary and real cause of the destruction of life which occurred, was the absence of what is in such common use in this country—an effective, rapidly acting automatic brake, that will retain its power over the train in case it becomes separated into parts by the breaking of the couplings. The train, it seems, was equipped throughout with Smith's vacuum brake, which became useless the moment the couplings gave way, and yet, according to Sir Edward Watkin, the "chairman" of this road, the Southeastern and the Metropolitan, it was the "best brake out," and "had Providence permitted the engine-driver to have gone 60 yards further nobody would have been hurt." It is to be hoped that Sir Edward will live long enough to perceive that Providence in such emergencies invariably sides with the best brake, just as he does with the heaviest artillery on the battle field.

As long as there is no compulsory legislation, and the merits of the different brake systems are a mere matter of opinion among the managers of English roads, the adoption of the automatic system will continue to drag its slow length along unless the movement shall be quickened by a marked discrimination on the part of the traveling public in favor of lines that use brakes that have an automatic action.

DINING CARS.

The *Railway Review* is rather inclined to agree with us in the opinion that dining cars as an additional accommodation for railway travelers have "come to stay," and in regard to the experience of Western roads with them, it remarks as follows:

> There are yet a large number of important lines which do not use these cars, and in the case of roads running east from Chicago, while they are used in some lines their rivals seek to avoid running them by means of well-kept dining rooms at convenient points, and there is not wanting a large proportion of the traveling public which had rather leave the cars and take meals at these rooms than patronize the lines running dining cars.
>
> We find where dining cars are run that the results of their use as regards paying their expenses vary widely on different lines and even upon the same roads at different times. In some cases upon the same line, they may not only succeed in paying expenses but may even show a material net profit, while again at another period there may be a large net loss.

The *Review* then goes into an analysis of the items of expense, and reaches the conclusion from the best data it has been able to obtain, that—

> When the cars are run to serve two meals per day on each one, they can hardly, by the most economical management, be made to pay expenses at 75 cents per meal. If three meals are served, with a reasonably good attendance, the expenses per car should be fully covered by the receipts, while if four meals can be provided there is every condition for an economical management to show a moderate profit at the end of the month in each car. Four meals per day may be assumed as the limit that can be served per car and due time be allowed for each.

The dining car system having originated at the West, we naturally look to that quarter for evidence of its utility as a source of profit to the roads and a convenience to the traveling public. But so far as an opinion can be formed from numerous articles that have appeared in the Chicago papers, some of them written apparently by railway men who are practically familiar with the working of the system on Western lines, the evidence as to its utility is decidedly conflicting. It is hardly worth while, therefore, to attempt to forecast the results as to profit and loss to the companies. Dining cars will doubtless continue to be run in special trains from the stimulus of rivalry and competition, and upon such trains they are likely to be kept up permanently unless the receipts fall so far behind the expenses as to make their discontinuance a necessity. It is simply a matter of dollars and cents, and it will not take long to strike the balance. In saying that they have come to stay, we mean that they will be used on certain trains, and on certain lines where there is a paying demand for them. But as for feeding people exclusively on dining cars, the thing is obviously impracticable, and for a variety of reasons which need not be stated. There is no necessity for working out the problem in advance when it is in a fair way to work itself out.

FAST FREIGHT LINES.

A few years ago an attempt was made to get up a hue and cry against these lines, and even now paragraphs are met with in the newspapers and railway journals, charging that they are excresences upon freight transportation, the effect of which is to absorb a large portion of the earnings of the roads which would otherwise be paid to the stockholders. There may have been some truth in these charges as applied years ago to the early organizations of such lines, which were then independent corporations, wheels within wheels, so to speak, owned and controlled by the leading officers of the several roads forming the line. That abuses of a flagrant character in some instances should have crept into their management was, perhaps, inevitable; but the vast increase of road mileage since then, and the enormous development of freight traffic have changed all that. Instead of such organizations being abolished in order to get rid of the alleged abuses, they have, on the contrary, been greatly modified and increased in number because the business community and the road companies could not afford to forego the advantages derived from them.

Before the establishment of fast freight lines, each road, whether long or short, had its own traffic, its own rates, classification and methods of conducting its freight business, without much regard to what other roads did. A consignment of through freight had to run the gauntlet of a series of roads, and be subject to vexatious delays growing out of mutual distrust, jealousy and rivalry. There was trouble in making transfers and in the payment of accumulated charges, solvent companies would not trust those that were bankrupt, contracts were ignored, and in case of damage to freight the owner found it cheaper to pocket the loss than to seek out the offending party among a number of companies all equally bent upon escaping responsibility. In this condition of things, it was a great boon to shippers and consignees to be able to deal directly with a single responsible entity, with its representatives in all the important commercial centers, who could give a bill of lading good from shipping point to destination, with guaranteed rates, quick dispatch, prompt delivery, and damages settled without delay. The certainty and celerity thus afforded made commercial ventures safer, saved time and relieved the individual roads from the troubles incident to the previous state of things.

The existing freight lines are an unavoidable outgrowth of the more recent development of railway business. They are simply combinations of connecting roads having a common interest at competing points beyond the termini of each, and are organized for the purpose of facilitating the details of through freight business. They have nothing to do with making or cutting rates, but merely keep records of the through business of the respective roads comprised in their organization, and divide the expenses and receipts among the companies upon the pro rata basis agreed upon, each company furnishing its quota of cars to be worked in the name of the line. Agents are appointed to secure traffic for the through line, and their salaries are paid by the roads according to their respective portions of the earnings. In this way a number of roads running in the same direction are made to form a continuous line which can be dealt with by shippers as one concern.

It is said by those who are hostile to the system that there is no necessity for these lines, now that loaded cars go from one end of the country to the other, and every road company issues through bills of lading. This, however, does not lessen the advantages of these co-operative lines. There is a vast and constantly increasing number of competing points, and in the absence of such lines every road would have to employ a special agent of its own at all important points or lose some of the business. Each road would also have to keep its account of interchange cars, car mileage and several other intricate details of the freight traffic, all of which is now kept at the headquarters of the freight lines. It is plain that the great trunk lines, with their immediate western connections, could no more transport through freight satisfactorily to the public without the intervention of this co-operative system, or some other system very nearly identical with it, than they could carry on the package express business. It would, of course, be very acceptable to the roads if the profits of the express companies could be added to their earnings, and no deductions made on the score of freight line management and operation. The relations of railways and railway systems with each other have not become so changed from what they were, that the fast freight line medium between them and the great shipping public can be profitably dispensed with. The system is a necessity and an advantage, or it never could have grown to its present dimensions. All good things, however, are liable to be abused. Let the abuses be corrected as far as possible, but the advantages to which they are only incidental should be retained

CALLING THE NAMES OF STATIONS.

The articulation of the average passenger car brakeman in calling out the names of stations is notoriously defective. As a vocal caricaturist he is not to be excelled. But the travesty is sometimes so much overdone that passengers with dull perceptions often fail to see the point. What he actually says is in some instances not even remotely suggestive of what he should say and means to say. As an illustration of this we give the names of some stations on a New Jersey road, and the rendering of them in the brakeman dialect as nearly as a pair of good ears could make it out as they were successively announced to the passengers: Whitehouse, "Right Here"; North Branch, "Chop Tank"; Raritan, "Heretin"; Summerville, "Telegram"; Bound Brook, "Round Book"; Fanwood, "Fair Park."

Although much has been said about this characteristic infirmity of brakemen, we are not aware that any systematic means have been resorted to for its cure, except a few mild complaints and a request to speak plainer. But this is not sufficient. A man may pronounce the name of a station with a passably good articulation, but if he shouts it out at an unnatural key and with the full strength of his lungs, the clearness of the enunciation is drowned in mere noise. A good deal depends of course on the physical structure of the vocal organs. If the roof of the mouth is nearly flat, a distinct articulation can only be acquired by diligent practice, but if it is very much hollowed out, little or no effort is required to speak plainly, because there is nothing to interfere with the free movement of the tip of the tongue in giving full and clear expression to the consonants. Let a brakeman who labors under no special vocal defect be instructed to announce stations in a voice but little louder than its natural key, but with as strong a desire to make himself understood as if he was angry with some adversary sitting in the middle of the car and was bent upon giving him a piece of his mind. It is not the volume of sound, but the sharp aspirated tone that sends the words clean-cut and distinct to the ear in spite of the noise of the train. As a proof of this let any one note the talk that is most easily heard in a car while it is running, and it will generally be that of persons with sharp, strident voices, of women scolding children or cross children eager to get something beyond their reach. A little elocutionary training of brakemen, with the necessary instruction, practice and effort, would, in our judgment, very materially abate the barbarous manner of calling the names of stations that is now so much in vogue.

COW-CATCHERS.

There is one thing about American locomotives that has hitherto defied innovation, and that is the cow-catcher. Bnt a raid is at last to be made upon it by an inventive demon who has no respect for a thing endeared by long usage, and until now, unquestioned utility. If it really has got to go, there is some consolation in knowing that the thing, strictly speaking, is not a cow-catcher exactly, and never was, because it don't catch cows as a lasso does wild cattle or as a trap does a rat, but only bounces them off the track in a rude and barbarous way that completely discourages the cow for the rest of her life, in case she survives the violence of the shock. It is just as likely to catch a tramp, or an absent-minded or intoxicated person, as a cow. Sometimes cow-catching engines, handicapped with heavy trains on up grades, don't catch the cows at all, especially if the animals are frisky and under pretty good headway. The innovation referred to is in the form of a patented improvement or substitute, which is of such a nature that the faster a train runs the safer the cows are. When overtaken by the engine they are simply scooped up without injury by a wide open-mouthed funnel, and carried by the momentum of the train through a canvas chute and deposited on a spring mattress in the baggage car. The chute runs over the top of the engine, and is heavily padded all through, to protect the cow from abrasion during her transit through it. The apparatus is called the "Patent Life-Saving Pilot," and will be tested in a preliminary way with goats, geese, pigs and such like small animals, then with tramps and absent-minded people, and finally a large chute will be used for full-grown cows, and if they go through safely, horns and all, the invention will be let loose on all the roads in the country.

By an inexcusable oversight, the name of the "Car Spring Testing Machine," in our September issue, was made to read "Car Testing Machine." The error was discovered too late to be corrected.

In regard to the paternity of this device, a prominent official of the Great Western Division of the Grand Trunk Railway informs us that a machine of the same kind was in use on the London & Northwestern Railway (England) as long ago as 1853, and was introduced in this country in February, 1868, by Mr. A. W. Robinson, the former Mechanical Superintendent of the Great Western Railway of Canada; the only improvement since made being in the sliding of the table for more conveniently testing nests of springs.

"Foreign Railways of the World": This is the title of a book of 480 pages that has just been issued by the *Railway Register*, of St. Louis, Mo. The compilation has been made by Mr. D. McArthur, the manager of that paper, and being a first attempt to condense and systematize the information contained in the volume, the inherent difficulty of the task involved no small amount of labor and research. So far as we can judge from a somewhat hasty examination, the work has been as thoroughly performed as the nature of the case will permit, and the result will prove very acceptable in railway and commercial circles, where there is an increasing demand for such information, and which it has hitherto been very difficult to obtain. The book contains a condensed history of all the railways in the world outside of the United States, including a large number of tramway lines, with mileage, gauge, headquarters and other particulars; also a name-list of United States roads and systems of roads, with mileage, figures and reference marks to indicate gauges. The title page has the imprint "Vol. I." and should the enterprise receive the encouragement which it certainly deserves, it is the intention of the compiler to continue its publication from year to year, with such additional information as may be obtained.

We have received a copy of the Directory of the city of Scranton, Pa., which contains a report of the Board of Trade of that city, showing its remarkable growth in popalation and business. In 1850 the place was not to be found in geographical charts. In 1860 the population was 9,223, in 1870 it had increased to 35,092, and in 1884 it is 67,062. The city is getting to be a railroad center, its marvelous growth being due to its peculiar location in the center of the great northern anthracite coal field, which affords an enormous tonnage of coal, iron, steel and lumber. According to the report, the estimated annual product of anthracite in Pennsylvania has increased from 8,513,123 tons in 1850, to 31,793,027 tons in 1884, about one third of which comes from the Lackawanna district, of which Scranton is properly the center.

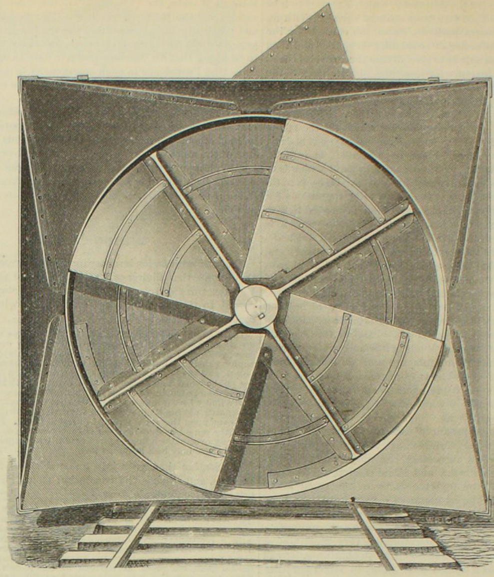

Fig. 2.—Front View, showing Revolving Knives.

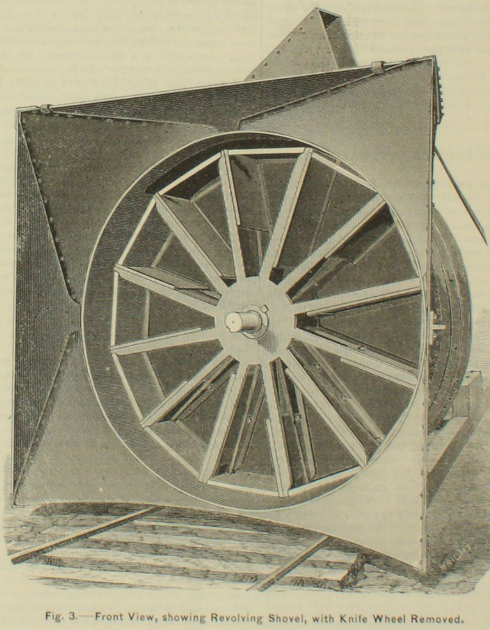

Fig. 3.—Front View, showing Revolving Shovel, with Knife Wheel Removed.

The Southeastern Railway Co. (England) have built a new six-wheel composite car of unique peculiarities. The great feature of it consists in electro-plated paneling, a material which was suggested to avoid the expense of repainting. The car is 32 feet long and is luxuriously fitted up. The moldings are of sheet copper stamped out under the press and electro-plated. In order to obtain greater strength, metal has been chiefly used in the construction of the car. All the pillars and roof sticks are of angle iron, and the under frame is made entirely of iron, while riveting has been brought into use where practicable.

It is said that the steamship "Great Eastern" has been chartered to bring foreign exhibits to the World's Exposition at New Orleans. The preparations are in such a state of forwardness that the Exposition can be opened, if necessary, on the first of November. Several of the Coney Island steamboats are to go to New Orleans to run between the Exposition and the city, and hotels are being erected near the grounds which will be able to accommodate 10,000 guests. A canvass by the Bureau of Information shows extra accommodations for about 25,000 people.

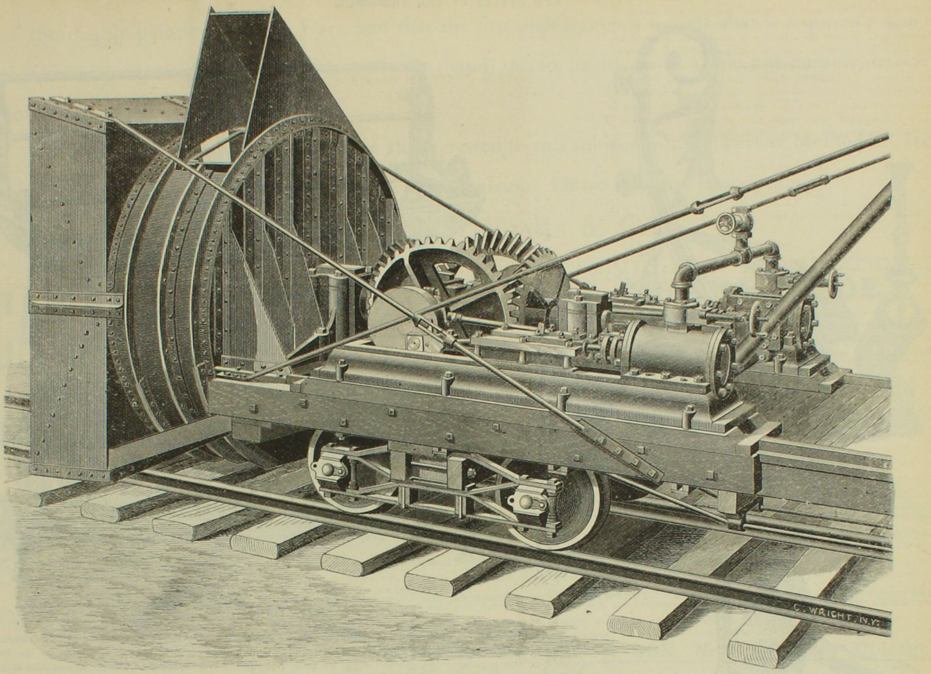

FIG. 1—ROTARY STEAM SNOW SHOVEL.

The engravings represent a new style of snow plow or, more strictly speaking, a shoveling machine, for removing heavy drifts and masses of snow from railway tracks, by cutting into the snow, and throwing it a considerable distance from the track. The machine is now in course of construction for the Rotary Steam Snow Shovel Manufacturing Co., of Paterson, N. J., and under the direction of the Superintendent of the company, Mr. Edw. Leslie.

Fig. 1 shows the machine mounted upon the end of a car and ready for operation. Fig. 2 is a front view of the cutters. Fig. 3 is a view of the fan or shovel wheel, which is placed directly behind the cutters, the cutters being removed in order to show the construction. The cutter head is 9 feet in diameter and has four blades. In the engraving the blades are shown as being rigid, but in the machine under construction they are arranged so that by means of a lever their pitch can be reversed, the front edge being thrown back and becoming parallel to the plane of rotation, while the other edge comes forward. This enables the machine to be run in either direction so as to deliver snow to the right or left as may be desired. The cutter head is carried on a shaft 6 inches in diameter and which revolves within a hollow 10-inch shaft. Its front bearing in the hollow shaft is 15 inches long. The hollow shaft carries a fan or shovel wheel with solid back of sheet steel. This has alternately long and short paddles or blades, and delivers the snow through the opening on the top of the plow in the same manner as a centrifugal pump. Both of these wheels, or heads, being overhung, a large bearing is necessitated. This bearing is ten inches in diameter by 20 inches long. At the back end of the hollow shaft is another bearing 9 inches long by 10½ inches in diameter. In order to resist the longitudinal forces upon the cutters, the solid shaft has a thrust block 11 inches long and 4 inches in diameter in the grooves, and 6 inches over the rings. The pitch of the blades is four feet, each one being intended to cut a 12-inch slice. In order to make a square excavation, a funnel is placed in front and around the cutters so the snow in the corners may be brought to the wheel. This is shown in the front view; though the engraving represents the plates of which it is composed as being lapped, the joints are really butted and the face made as smooth as possible. These front plates are ⅜ of an inch thick, and are braced with angle iron. The fan or shovel wheel revolves in a cylindrical case made of half-inch plates, strengthened by 3½-inch angle irons put on with ¾-inch rivets. This case is supported by six ½-inch boiler-plate brackets 15 inches deep, riveted to the steel casting which forms the bed of the machine and stiffened by angle irons as well. The lower corners of the funnel or scoop are braced to the side of the cylindrical portion by means of two 6 by 6 inch oak timbers. The top corners are held in place by a pair of stay rods. The machine is driven by a pair of engines having 16 by 20 inch cylinders. The fan and cutters having to revolve in opposite directions, the power is applied through four bevel wheels 45 inches in diameter and 3½ inches pitch. The application of the power in this way relieves the main bearing to a great extent from unequal pressure. The crank shaft journals are 4½ inches in diameter by 8 inches long. Power to drive the fan and cutters is obtained from a boiler placed on the rear end of the car on which the machine is mounted.

In actual use all the working parts have to be carefully housed, in order to protect them from the snow, which would otherwise soon stop the machinery. The greater portion of the castings, including the cutter wheel, cutter wheel spider and spider for the shovel wheel bed plate, are of cast steel. The back of the shovel wheel is of steel boiler plate. In all parts equal care has been taken to secure the utmost strength.

The operation of the machine is entirely different from that of the ordinary plows, as may be seen from a glance at the construction. There is no pushing to one side of a body of snow nor is there any of the consequent consolidation of the snow in opening a cutting. The spiral blades in striking a bank slice off the front and throw it back into the fan or shovel wheel, which is revolving at a high rate of speed in the opposite direction, from which it is instantly discharged and projected a long distance to the right or left, as may be necessary. The rate of speed is calculated to be from 200 to 300 revolutions per minute. The edges of the cutters trim the bank to shape and throw the snow into the wheel as it is pushed forward by the locomotive.

In connection with the machine, an improved form of flange cleaner is used, but which is not shown in the cuts. It is so arranged that the plow can be run forward where the ice has filled the space between the rails and yet leave a perfectly clean track.

A machine of similar construction was successfully operated on one of the Canadian roads last winter, showing that a start could be made into a snow-bank in a cut already packed by an ordinary snow plow, and a clear excavation made directly through it after it had been drifted full.

The Gowan Car Wheel Boring and Truing Machine.

The following letter of Mr. J. H. Raymond, attorney of the Western Railroad Association, addressed to the Gowan Car Wheel Tool Co., explains itself:

CHICAGO, Ill., April 17, 1884.

To the Gowan Car Wheel Tool Co.:

GENTLEMEN: I take pleasure in informing you that I have been successful in my negotiations with the Chilled Car Wheel Grinding Company, of Nevada, and that the papers settling all of the pending controversies with that company have been duly executed and recorded in the Patent Office, pursuant to which you have the full right and liberty to make, to cause to be made, and to sell machines for Truing, either by Abrading or Turning, and for boring car wheels either before they are pressed on their axles or after they shall be removed therefrom, under your letters patent No. 285,123, dated September 18, 1883, without thereby incurring any difficulties of infringement of any prior patents either on your part or on the part of those to whom you may sell said machines.

The papers referred to as concluding all controversies in the premises, have been submitted to the Eastern and Western Railroad Associations and you are at liberty to refer any railroad company with which you may negotiate to either of said Associations for the confirmation of above. Respectfully, etc.,

J. H. RAYMOND, Attorney.

Recent Sales made by the Huyett & Smith Mfg. Co., Detroit, Mich.

Courey, Waller & Duprey, Shelbyville, Ind., 1 No. 3 Single Exhaust Fan
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Benwood Iron Works, Benwood, W. Va., 1 No. 8 Double Exhaust Fan.
Meridian Sash and Blind Fac'y, Meridian, Miss., 1 No. 7 Double Exhaust Fan.
Chidester & Mellon, Memphis, Tenn., 1 No. 2 Single Exhaust Fan.
Wm. J. Lemps Western Brewery, St. Louis, Mo., 3 60″ Ventilators.
John W. Brown, Wharton, Tex., 1 No. 5 Single Exhaust Fan.
Kimball & Hatch, Minneapolis, Minn., 1 34″ Ventilator.
Nashville Warehouse Co., Nashville, Tenn., 1 No. 6 Double Exhaust Fan.
Ph. Best Brewing Co., Milwaukee, Wis., 2 60″ Ventilators.
Texas Tram Lumber Co., Beaumont, Tex., 1 No. 5 Double Exhaust Fan.
Wm. Hall's Sons, New York, N. Y., 2 No. 6 Single Exhaust Fans.
Emerson, Talcott & Co., Dallas, Tex., 1 No. 5 Single Exhaust Fan.
Von Behren & Co., Evansville, Ind., 1 No. 8 Double Exhaust Fan.
L. Preston & Co., Evansville, Ind., 1 No. 8 Double Exhaust Fan.
Jno. H. Conrades Chair Co., St. Louis, Mo., 1 60″ Ventilator.
Paine Lumber Co., Oshkosh, Wis., 3 No. 12 Double Exhaust Fans.
R. McMillan & Co., Oshkosh, Wis., 1 ea. Nos. 12, 10 and 7 Double Exhaust Fans.
Tho. Alling & Co., New Haven, Conn., 1 ea. Nos. 4 and 7 Double Exhaust Fans.
Boss Planing Mill, Altamont, Fla., 1 No. 3 Single Exhaust Fan.
Jno. McCullough, Brunswick, Ga., 1 No. 3 Double Exhaust Fan.
Raleigh Oil Fertilizing Co., Raleigh, N. C., 1 No. 4 Cotton Elevator.
Hatch & Stamps, Milton, N. C., 1 Forge Blower.
Seberling & Co., Akron, O., 1 No. 7 Double Exhaust Fan.
McDonald Bros., La Crosse, Wis., 1 No. 5 Single Exhaust Fan.

NEW STYLES OF CAR TRIMMINGS.

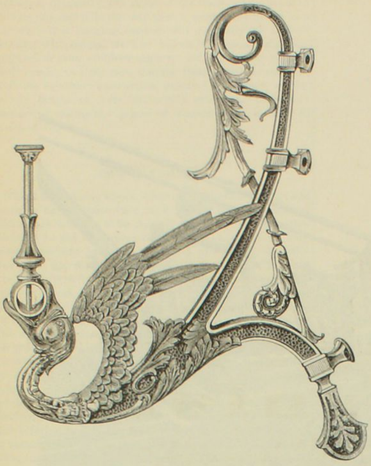

Fig. 1.

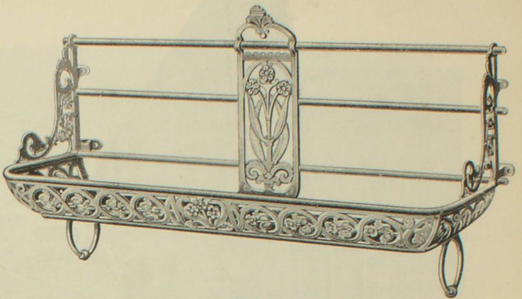

Fig 4.

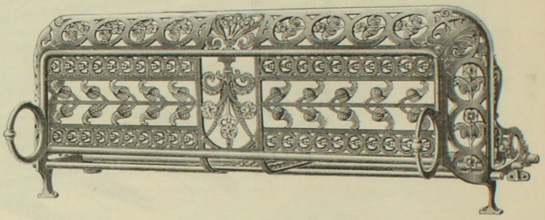

Fig. 5.

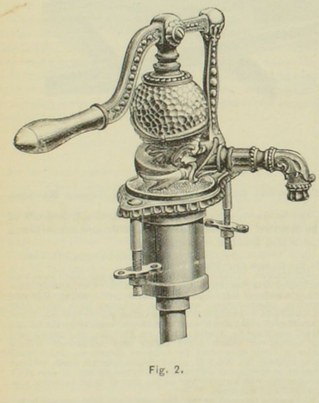

Fig. 2.

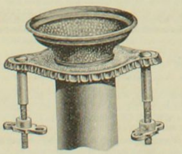

Fig. 3.

The accompanying cuts illustrate some new and beautiful car trimmings, designed and made by the Dayton Manufacturing Co , for twelve sleeping-cars, built for the Canadian Pacific road by the Barney & Smith Manufacturing Co. The designs were new throughout for all the metal-work of the cars. A set of trimmings was also furnished from the same designs for four cars built by the Jackson & Sharp Co. for the Woodruff Sleeping & Parlor Car Co. The Dayton Company have also completed a set of designs of similar style and character for ordinary coaches.

The finish of these trimmings is technically known as oxidized gold, and is made both dark and light. It bears the same relation to gold that oxidized silver does to silver, but is much more brilliant. having all the richness of bronze combined with the peculiar beauty of the gold. In the Canadian Pacific cars the dark shade was used in order to harmonize with the finish and dark hangings, the result being very rich, striking and effective. The work is executed in the popular "hammered" style so well suited to copper and gold, but which has also become quite the rage in its application to silver. It originated in a certain style of copper work which was finished by leaving the marks of the round-faced hammer evenly disposed all over the surface of the metal. The result of this treatment is an even mottle composed of small depressions. The finish has the elements of durability, and seems likely to show the effects of wear very slightly, the raised portions which wear the most rapidly being intended to remain bright.

The curtain rod bracket, shown in Fig. 1, is one of the most striking of these designs. Its curves are very graceful, and the taper of the parts proportioned so as to give the bracket a light appearance. The artist, in designing this and the other metal work, adhered closely to the style in which he had begun, preserving the artistic harmony and preventing the incongruous combinations which are too frequently an eye-sore in work of this kind. The curtain rods which these brackets support are of hammered tubing of the same color as the other metal work.

The pump, Fig. 2, is quite as rich in appearance as the bracket, but though in the same style, is as different as could well be imagined. The top is formed by a globular air chamber, which rests on a dragon's head. From the mouth springs the spout of the pump. The form of the air chamber shows off the hammered work to the best advantage and contrasts well with the fine modeling of the details of the head. An improved form of construction has been adopted in the pump, so that when in operation it throws a continuous stream of water. Another improvement is in the method of putting the joints together. This is done so that the screws are prevented from working loose, thus obviating one of the very annoying features of the common pump. The soap-dish is shown in Fig. 3. It is neat and plain in design, as its hould be. The use to which it is put requires little or no ornament. A front and bottom view of the basket rack is shown in Fig. 4. It may seem almost unnecessary to say that these racks are intended for the holding of small articles as well as large ones, but as this is not always considered in designing them, the fact may as well be mentioned. The corners are well rounded, and there are no sharp points to inflict injury in case of accident. Both sides and bottom are made up of conventional foliage. Fig. 5 shows a bottom view of the rack, and gives a very good idea of the pretty ornamentation and also of the method by which the corner is made.

Mr. W. W. Greene has been appointed Assistant Superintendent of the Woodruff Sleeping & Parlor Coach Co., in place of W. H. Poulson, resigned. His headquarters will be in Philadelphia.

An engine of a novel type, designed by Charles B. Coventry, has recently been constructed by the Brooks Locomotive Works, for the Chicago Locomotive Improvement Company. The headlight is placed where the stack generally is, while the stack is at the rear of the boiler and close to the cab. The boiler is one of the largest manufactured (what is known as a 60 inch shell), and the smoke, gas, etc., traverse it twice, along the bottom and over back on top to the stack. This makes such a good combustion that the finer particles of fuel, the gas and the smoke are almost entirely consumed, and when the engine is going at full speed, it is impossible to see any smoke. The smoke stack itself is very small, being not more than seven or eight inches in diameter. Among the advantages of this invention it is said it gets a steady, even draught, reduces the waste of fuel to a minimum, and throws no cinders, sparks, or fire. The locomotive is peculiar in appearance, but it is said that it does its work well. It weighs forty tons.—*Scientific American.*

Our Directory.

We note the following changes since our last issue. Our readers will do us a great favor by giving us prompt notice of any changes that may come to their knowledge or of any errors that may be noticed in our list:

Detroit, Grand Haven & Milwaukee.—R. P. Bailie has been appointed Master Mechanic in place of Jas. Bleasdale.

Fitchburg.—Orlando Stewart has been appointed Superintendent of Motive Power in place of G. A. Coolidge, resigned.

Marquette, Houghton & Ontonagon.—John Hornby has been made General Manager in place of Samuel Schoch, resigned.

New York & New England.—W. A. Stone has resigned the position of Master Mechanic of the Norwich Division.

Rochester & Pittsburgh.—C. W. Mills has been appointed Superintendent of Motive Power, in place of J. P. Hovey, resigned.

St. Paul & Duluth.—Charles F. Ward has been appointed Master Mechanic, vice W. McFarland, resigned.

Texas & St. Louis.—Geo. W. Prescott has resigned the position of Superintendent of Motive Power and Machinery.

Union Pacific.—R. S. Callaway has been appointed General Manager, in place of S. H. H. Clarke, resigned.

Employment.

Wanted.—A position as Master Car-Builder on a railroad, or as Superintendent or Foreman in a contract shop. The applicant has had fifteen years' experience as a master car-builder on one of the leading roads of the country. Address "Como," office of National Car-Builder.

Wanted.—A young Mechanical Draughtsman (married), thoroughly familiar with every detail of car work, both freight and passenger, and with three years' experience on locomotive work, desires a permanent position with a railroad company. Address "Gondola," office of National Car-Builder.

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CHICAGO & ALTON RAILROAD CO., A. V. Hartwell, Purchasing Agent, Chicago, Ill.
CHICAGO & NORTHWESTERN RAILROAD CO., R. W. Hamer, Purchasing Agent, Chicago, Ill.
LEHIGH VALLEY RAILROAD CO., L. Chamberlin, Purchasing Agent, Philadelphia, Pa.
NORTHERN RAILROAD OF CANADA, F. W. Cumberland, Superintendent, Toronto, Ont.
NAUGATUCK RAILROAD CO., G. W. Beach, Superintendent, Waterbury, Conn.
PHILADELPHIA, WILMINGTON & BALTIMORE RAILROAD CO., S. A. Hodgman, Superintendent of Motive Power, Wilmington, Del.
NEW YORK, NEW HAVEN & HARTFORD RAILROAD CO., R. N. Dowd, Commissary, New Haven, Conn.
UNION PACIFIC RAILROAD CO., } A. D. Clark, Purchasing Agent, Omaha, Neb.
KANSAS " " " }
CHICAGO, BURLINGTON & QUINCY RAILROAD CO., Wm. Irving, Purchasing Agent Chicago, Ill.
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GRAND TRUNK RAILWAY N. Wall, Port Huron, Mich.
LITTLE ROCK & FORT SMITH RAILROAD CO., T. Hartman, Purchasing Agent, Little Rock, Ark.
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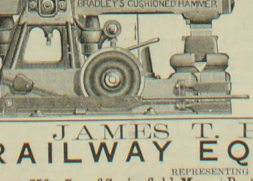

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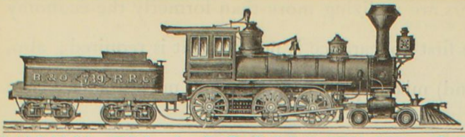

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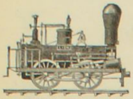
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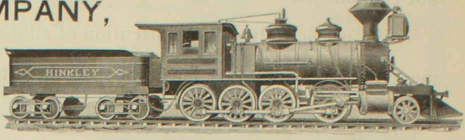

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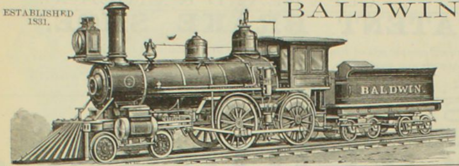

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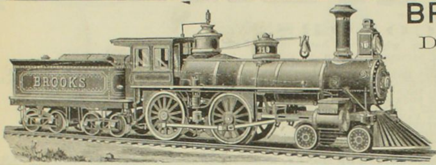

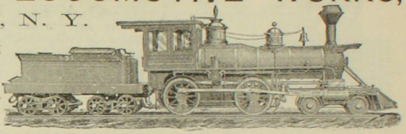

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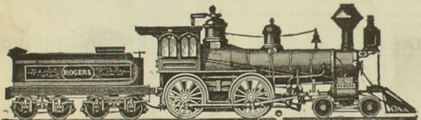

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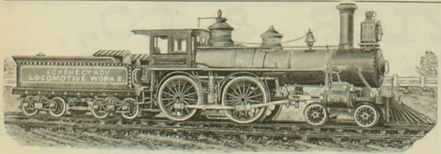

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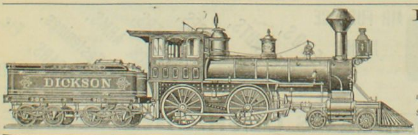

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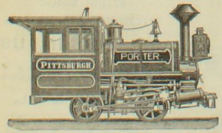

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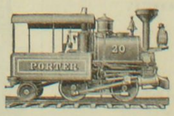
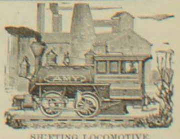


LOGGING LOCOMOTIVE



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Builders of all Kinds of
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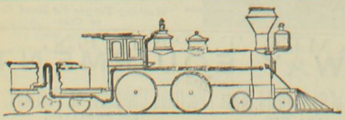

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The Ashton Blow-back Safety-valve is constructed so as to conduct the escape steam which is blown off back to the tender, or to the smoke-box and up the chimney. By this arrangement the heat of the escape steam, instead of being wasted as it is when an ordinary safety-valve blows off, is communicated to the cold water in the tender. This not only results in an important economy, but it renders the escaping steam noiseless, and the increase of temperature of the water has a tendency to deposit some of its impurities before it is pumped into the boiler. It thus *stops the noise! saves fuel! and al. engines steam better and faster, and do more effective work with these valves* than with those in ordinary use.

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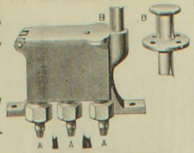

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Which causes so many Boiler Explosions.

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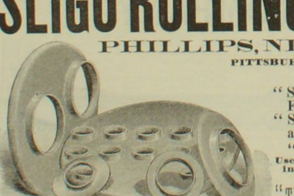

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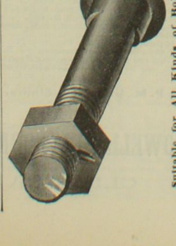

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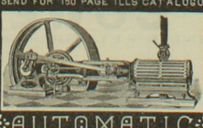

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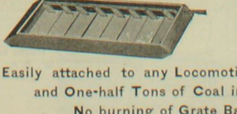

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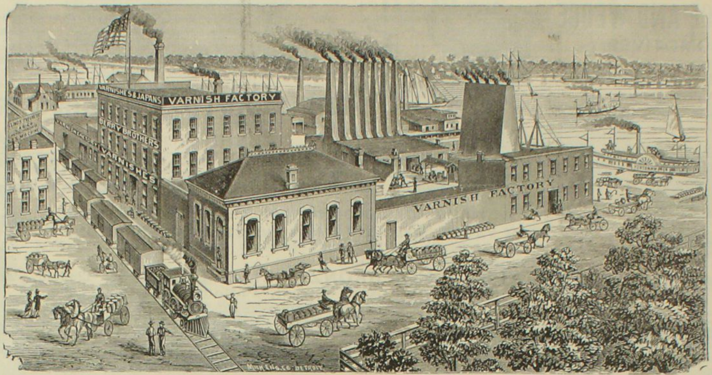

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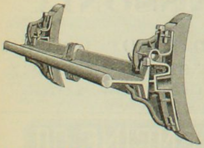

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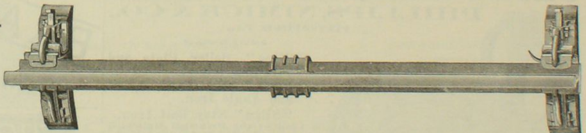

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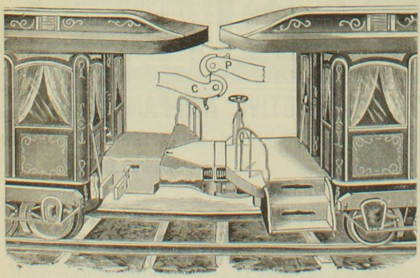

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"Entire Satisfaction"—"Perfect Satisfaction" are the words used by R. F. Smith, Gen'l Manager Cleveland & Pittsburgh R. R.; Hiram Fowler, Supt. Connecticut Valley R. R.; J. W. Thomas, Gen'l Supt. Nashville, Chattanooga & St. Louis Ry.; J. G. Sawyer, Master Car-Builder same road, and many others.
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"Saving much annoyance to passengers"—Chas. B. Couch, Div. Sup't Lake Shore & M. S. Ry., and others.
"A great improvement over any other device I have seen"—J. H. Tinney, Sup't N. Y. & Greenwood Lake Railway.
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CLEVELAND, O.

DIRECTORY

of the Railroads of the United States and Canada, showing the gauge, length of road, number of locomotives and number of cars; and giving the names and titles of their principal officers in charge of the operating, purchasing and rolling stock departments.

A

Adirondack R. R. 4-8½ gauge 60 m. 3 lo. 62 cars.
C. E. Durkee, *Supt* ......Saratoga, N. Y.
Jacob Myers, *M. M* ......Saratoga, N. Y.
Jas. J. Traver, *M. C. B*......Saratoga, N. Y.
Addison & Northern Penn'a Ry. 3 g. 46 m. 5 lo. 50 c.
F. M. Baker, *Gen. Supt*......Addison, N. Y.
Alabama Great So'n R. R. (*See Cin., N. O. & T. P.*)
Albany & Susquehanna R. R. (*See D. & H. Canal Co.*)
Albemarle & Raleigh R. R. 4-8½ g. 33 m. 3 lo. 35 c.
Jas. H. Petty, *Gen. Supt*......Tarboro, N. C.
Albert Ry. 4-8½ g. 51 m. 3 lo. 35 cars.
G. A. Robinson, *Man. & Pur. Agt.* Hillsboro, N. B.
Jas. McKay, *M. M. & C. B*......Hillsboro, N. B.
Alexandria & Fredericksburg Ry. } *See Penna. R. R.;*
Alexandria & Washington R. R. } (7) *Div.*
Allegheny Valley R. R. 4-9 g. 259 m. 70 lo. 2202 c.
David McCargo, *Gen. Supt. & Pur. Agt.*; and
C. B. Price, *Supt.* (Riv. Div.)......Pittsburg, Pa.
A. A. Jackson, *Supt.* (L. G. Div.). Reynoldsville, Pa.
W. A. Wood, *M. M*......Verona, Pa.
R. Gunning, *M. C. B*......Verona, Pa.
Alliance, Niles & Ashtabula R. R. (*See Penna. Co.*)
Annapolis & Elk Ridge R. R. 4-8½ g. 20 m. 4 lo. 29 c.
W. H. Bians, *Supt. & Pur. Agt*..Annapolis, Md.
John L. Beall, *M. Mach*......Annapolis, Md.
Antwerp & Paulding R. R. 4-8½ g. 6 m. 4 lo. 63 c.
E. C. Munson, *Gen. Man*......Antwerp, O.
William Fitzsimmons, Jr., *Pur. Agt.* Antwerp, O.
Arizona & New Mexico Ry. 3 g. 71 m. 3 l. 60 cars.
W. H. Jones, *Gen. Supt. & P. A.* Lordsburg, N. M.
W. C. Boylan, *M. M. & M. C. B.* Lordsburg, N. M.
Arkansas Midland R. R. 3-6 g. 63 m. 4 lo. 45 cars.
A. H. Johnson, *Pr. & Gen. Man*...Helena, Ark.
J. B. Johnson, *M. M. & M. C. B*...Helena, Ark.
Asheville & Spartanburg R. R. 5 g. 49 m. 2 lo. 12 c.
Jas. Anderson, *Supt. & Pur. Agt*..Spart'b'g, S. C.
M. M......Spartanburg, S. C.
W. B. Brown, *M. C. B*......Spartanburg, S. C.
Ashland Coal & Iron Ry. 4-8½ g. 22 m. 7 lo. 432 c.
Douglas Putnam, Jr., *Gen. Supt.* Ashland, Ky.
Robt. Peebles, *Pur. Agt*......Ashland, Ky.
E. M. Roberts, *M. M*......Ashland, Ky.
Ashtabula & Pittsburgh Ry. (*See Penna. Co.*)
Atchison, Topeka & Santa Fé R. R.
4-8½ g. 2,620 m. 348 lo. 9,629 cars.
A. A. Robinson, *Gen. Man*......Topeka, Kan.
Geo. B. Harris, *Asst. Gen. Man*...Topeka, Kan.
Geo. Hackney, *Supt. Mach*......Topeka, Kan.
Clem. Hackney, *Asst. Sup. Mach. Dept.* do.
Geo. Hargraves, *Pur. Agt*......Topeka, Kan.
Eastern Div.: D. J. Chase, *Supt.*..Topeka, Kan.
Henry Hull, *G. F. Car Dept*......Topeka, Kan.
John Fagan, *M. M*......Atchison, Kan.
J. M. Smith, *M. M*......Kansas City, Mo.
Alfred Taylor, *M. M*......Emporia, Kan.
Mid. Div.: H. R. Nickerson, *Supt.* Nickerson, Kan.
W. Y. Johnson, *M. M*......Nickerson, Kan.
......Dodge, Kan.
W. Div.: C. M. Rathburn, *Supt*......La Junta, Col.
A. C. Stiles, *M. M*......La Junta, Col.
D. H. Dotterer, *M. M*......Raton, N. M.
Las Vegas Div.: Chas. Dyer, *Supt.* Las Vegas, N. M.
F. B. Woodruff, *M. M*......Las Vegas, N. M.
J. H. Holman, *M. M*......Wallace, N. M.
Rio Gr. Div.: P. F. Barr, *Supt.* San Marcial, N. M.
E. Hackett, *M. M*......San Marcial, N. M.
H. P. Olcott, *M. M*......Deming, N. M.
Geo. A. Hancock, *M. M*......El Paso, Tex.
Sonora Div.: 265 m.
L. H. Waugh, *M. M*......Guaymas, Mex.
Kan. Cy., Law. & So. Kan.
4-8½ g. 399 m. 24 lo. 787 c.
J. L. Barnes, *Supt*......Lawrence, Kan.
T. D. Volk, *M. M*......Ottawa, Kan.
Atlanta & West Point R. R. (*See Western of Ala.*)
Atlantic & North Carolina R. R. (*See Midland; N. C.*)
Atlantic, Tenn. & Ohio R. R. (*See Rich. & Dan.*; (2) *Div.*)
Atlantic & Pacific R. R. 4-8½ g. 575 m.
F. W. Smith, *G. Supt*......Albuquerque, N. M.
A. G. Thompson, *Pur. Agt*......St. Louis, Mo.
Geo. Chalender, *Supt. M. P. & M.*, and
Geo. F. Chalender, *A. Supt.* Albuquerque, N. M.
Div. Supt......Williams, Ariz.
Augusta & Knoxville R. R. (*See Port Royal & Aug.*)
Austin & Northwestern R. R. 3 g. 60 m. 5 lo. 75 c.
J. A. Rhoonberg, *Gen. Man*......Austin, Tex.

B

Bachman Valley R. R. (*See Han. Junc., Han. & Gett.*)
Balt. & Delaware Bay R. R. 4-8½ g. 50 m. 2 lo. 13 c.
Fred Gerker, *Gen. M. & P. A.* Chestertown, Md.
Baltimore & Hanover R. R. (*See H. J., H. & G.*)
Baltimore & Ohio R. R.
4-8½ g. 1,612 m. 574 lo. 17,339 cars.
S. Spencer, *2d V. P. & Gen. Man.* Baltimore, Md.
N. S. Hill, *Pur. Agt*......Baltimore, Md.
Ohio Riv. Div. 4-8½ g. 972 m.
W. M. Clements, *Mast. Trans.* Baltimore, Md.
A. J. Cromwell, *Act. M. of M.*.Baltimore, Md.
E. W. Grieves, *Act'g M. C. B*..Baltimore, Md.
I. N. Kalbaugh, *M. M*......Baltimore, Md.
Wm. Edwards, *M. M*...Martinsburg, W. Va.
Sam. Houston, *M. M*......Piedmont, W. Va.
Robert Maxwell, *M. M*......Cumberland, Md.
S. B. Crawford, *M. M*......Grafton, W. Va.
Alex. Laird, *M. M*......Parkersburg, W. Va.
W. B. McClung, *M. M*......Wheeling, W. Va.
Pitts. Div.: T. M. King, *Gen. Supt*...Pittsburg, Pa.
J. E. Sampsell, *Ast. M. of M.* Connellsville, Pa.
Trans-Ohio Divs.: G. J. Foreacre, *G. Man.* Newark, O.
W. H. Harrison, *Asst. M. of Mach*..Newark, O.
E. L. Weisgerber, *M. M*......Newark, O.
H. M. Ingler, *M. M*......Bellaire, O.
O. B. Perkins, *M. M*......Zanesville, O.
Andrew Beckert, *M. M*......Sandusky, O.
F. J. Gunther, *M. M*......Chicago Junction, O.
Chi. Div.: *Gen. Supt*...Chicago, Ill.
Benj. Lowther, *M. M*......Garrett, Ind.
W. H. Wilkinson, *M. M*......Kingston, Ill.
Baltimore & Philadelphia. 4-8½ g. 20 m. 4 lo. 35 c.
D. Connell, *Supt*......Wilmington, Del.
Baltimore & Potomac R. R. (*See Penna. R. R.*; (7) *Div.*)
Bangor & Piscataquis R. R. 4-8½ g. 63 m. 4 lo. 87 cars.
Arthur Brown, *Supt. & Pur. Agt*..Bangor, Me.
C. S. Nason, *M. M*......Bangor, Me.
J. W. Comins, *M. C. B*......Oldtown, Me.
Bangor & Portland Ry. 4-8½ g. 25 m. 3 lo. 3 c.
C. Miller, *Pres. & Gen. Man*...Blairstown, N. J.
Barclay R. R. 4-8½ g. 16 m. 6 l. 200 c.
F. F. Lyon, *Supt*......Barclay, Pa.
J. A. Hardenburg, *Pur. Agt*..21 Cort. st., N. Y.
Wm. Johnson, *M. M*......Towanda, Pa.
Batesville & Brinkley R. R. 3 g. 25 m. 2 lo. 34 c.
R. W. Martin, *Pres*......Little Rock, Ark.
W. J. Thompson, *Gen. Man*..Little Rock, Ark.
E. Summerfield, *Gen. Supt*......Brinkley, Ark.
R. B. Davis, *Pur. Agt*......Brinkley, Ark.
John White, *M. M*......Brinkley, Ark.
Baton Rouge, Grosse Tête & Opelousas R. R.
5-6 g. 29 m. 3 lo. 12 c.
D. C. Montan, *Gen. Supt*......Port Allen, La.
Bedford & Bloomfield Ry. 3 g. 43 m. 5 lo. 65 cars.
Jas. W. Kennedy, *Gen. Supt. & Pur. Agt.*; and
Capt. Geo. Elliott, *M. M*......Bedford, Ind.
Richard G. Elliott, *M. C. B*......Bedford, Ind.
Bellaire, Zanesville & Cin. Ry. Co. 3 g. 42 m. 5 lo. 71 c.
S. L. Mooney, *Gen. Supt*......Woodsville, O.
J. B. Hong, *M. M*......Bellaire, O.
Bell's Gap R. R. 4-9 g. 23 m. 4 lo. 148 cars.
R. G. Ford, *Supt*......Bellwood (P. O.), Pa.
Geo. Van Brunt, *M. M*......Bellwood, Pa.
A. Zimmerman, *M. C. B*......Bellwood, Pa.
Belt R. R. 4-8½ g. 12 m. 10 lo.
W. P. Ijams, *Supt*......Indianapolis, Ind.
Bennington & Rutland Ry. 4-8½ g. 59 m. 10 lo. 236 c.
F. C. White, *Supt. & Pur. Agt.* Bennington, Vt.
G. W. Blanchard, *M. M*......Rutland, Vt.
Berlin Branch R. R. (*See Han. Junc., Han. & Gett.*)
Bingham, Canyon & Camp Floyd (*See Den. & Rio Gr.*)
Bladen, Columbus & Florida. 4-8½ g. 16 m. 2 lo. 2 c.
John Colville, *Pres*......Wilmington, N. C.
Bog & Benton Ry. 3 g. 34 miles.
Thomas Holt, *Supt. & Pur. Agt*......Bodie, Cal.
E. H. Barton, *M. M. & C. B*......Bodie, Cal.
Boston, Barre & Gardner. 4-8½ g. 37 m. 8 lo. 108 c.
H. H. Marshall, *Supt. & P. A.*.Worcester, Mass.
Frank L. Goodwin, *M. M*......Worcester, Mass.
Boston, Hoosac Tunnel & W'n Ry.
4-8½ g. 87 m. 18 lo. 1,038 cars.
H. L. Morrill, *Gen. Man*..Mechanicsville, N. Y.
C. H. Cory, *Pur. Agt*......Mechanicville, N. Y.
C. H. Cory, *Supt. & M. M*..Mechanicville, N. Y.
John S. Ellis, *M. C. B*......Mechanicville, N. Y.
Boston, Revere Beach & Lynn R. R. 3 g. 9 m. 7 lo. 46 c.
C. A. Hammond, *Supt. & P. Agt.* Boston, Mass.
R. D. Sutherland, *M. M*......Boston, Mass.
John Coghlan, *M. C. B*......Boston, Mass.
Boston, Winthrop & Point Shirley R. R.
3 g. 10 m. 1 lo. 8 c.
C. A. Parks, *Supt*......Boston, Mass.
J. W. Davis, *M. M*......Winthrop, Mass.
Boston & Albany R. R. 4-8½ g. 372 m. 245 lo. 6,111 c.
W. H. Barnes, *Gen. Supt*......Boston, Mass.
E. Gallup, *Asst. Supt*......Springfield, Mass.
A. B. Underhill, *Supt. M. P*...Springfield, Mass.
F. D. Adams, *Gen. M. C. B*......Allston, Mass.
H. B. Chesley, *Div. Supt*......Boston, Mass.
G. H. Colby, *Div. M. M*......Boston, Mass.
C. E. Grover, *Div. Supt*....Springfield, Mass.
H. W. Eddy, *Div. M. M*...Springfield, Mass.
J. B. Weston, *For. Car Sh.* Springfield, Mass.
W. H. Russell, Jr., *Div. Supt.* E. Albany, N. Y.
T. B. Purvis, *Div. M. M*..East Albany, N. Y.
J. E. Doran, *For. Car Sh*..East Albany, N. Y.
Boston & Lowell R. R.
4-8½ g. 140 m. 82 lo. 2,565 cars.
C. S. Mellen, *Supt*......Boston, Mass.
F. H. Nourse, *Pur. Agt*......Boston, Mass.
Jas. A. Taylor, *Supt. R. S. & M.* Concord, N. H.
So. Div.: J. F. Crockett, *Supt*......Boston, Mass.
No. Div.: Geo. A. Todd, Supt......Concord, N. H.
Wh. Mount Div.: W. A. Stowell, *Supt.* Concord, N. H.
Geo. A. Furguson, *M. M*......Concord, N. H.
Boston & Maine R. R. 4-8½ g. 206 m. 89 lo. 2,209 c.
J. T. Furber, *Gen. Supt. & P. A*..Boston, Mass.
Geo. J. Fisher, *Pur. Agt*......Boston, Mass.
Wm. Smith, *M. M*......Boston, Mass.
D. C. Richardson, *M. C. B*......Lawrence, Mass.
Boston & N. Y. Air Line R. R. (*See N. Y., N. H. & H.*)
Boston & Providence R. R. 4-8½ g. 67 m. 52 lo. 1,006 c.
A. A. Folsom, *Gen. Supt. & P. A.* Boston, Mass.
Geo. Richards, *M. M*......Roxbury, Mass.
Jno. Lightner, *M. C. B*......Roxbury, Mass.
Bowling Green R. R. 4-8½ g. 6 m. 2 lo. 4 c.
Wm. A. Wiggins, *Gen. Man.* Bowling Green, O.
Wm. A. Wiggins, *Pur. Agt*..Bowling Green, O.
Bradford, Bordell & Kinzua R. R. 3 g. 42 m. 6 lo. 82 c.
Bradford, Eldred & Cuba. 3 g. 54 m. 6 l. 158 c.
Tonawanda Valley & Cuba. 3 g. 60 m. 5 lo. 31 c.
B. C. Williams, *Gen. Man. & P. A*..Brad'fd, Pa.
Jno. Delaney, *M. M. & C. B*......Bradford, Pa.
Brattleboro' & Whitehall R. R. 3 g. 36 m. 3 lo. 56 c.
(*Operated by Central Vermont.*)
Breakwater & Frankford R. R. (*See Del., Md. & Va.*)
Bridgton & Saco River R. R. 2 g. 16 m. 2 lo. 19 c.
Wm. F. Perry, *Gen. Supt*......Bridgton, Me.
M. M. Caswell, *M. M. & Pur. Agt.* Bridgton, Me.
Brighthope Ry. 3 g. 37 m. 4 lo. 193 cars.
Jas. R. Worth, *Supt*......Richmond, Va.
P. M. Buckingham, *Pur. Agt* Richmond, Va.
A. Gary, *Supt. Way & Works.* Winterpock, Va.
Robt. Kredell, *M. M*......Chester, Va.
Brooklyn, Bath & Coney Island R. R.
4-8½ g. 7 m. 8 lo. 36 cars.
Geo. A. Gunther, *Gen. Man*...Brooklyn, N. Y.
Aug. Wolff, *M. M*......Brooklyn, N. Y.
Brooklyn, Flatbush & Coney Island Ry.
4-8½ g. 7 m. 7 lo. 54 c.
J. L. Morrow, *Supt. & P. A*...Brooklyn, N. Y.
Wm. Finley, *M. M*......Brooklyn, N. Y.
Brooklyn & Rockaway Beach R. R.
4-8½ g. 3 m. 2 lo. 18 cars.
Wm. Warner, *Supt*.....East New York, N. Y.
Brunswick & Western R. R. 5 g. 172 m. 13 lo. 170 c.
H. S. Morse, *Gen. Man. & P. A*..Brunswick, Ga.
R. J. Evans, *Supt*......Brunswick, Ga.
W. R. Kline, *M. M*......Brunswick, Ga.
Buff., N. Y. & Phil. R. R. 3 & 4-8½ g. 655 m. 120 l. 6,339 c.
Geo. S. Gatchell, *Gen. Supt*......Buffalo, N. Y.
W. W. Halsey, *Asst. to G. Supt*..Buffalo, N. Y.
Allen Vail, *Supt. M. P. & M*......Buffalo, N. Y.
Buff. Div.: Henry Dwyer, *Supt*......Buffalo, N. Y.
Roch. Div.: J. W. Watson, *Supt*......Olean, N. Y.
Pitts. Div.: E. H. Witter, *Supt*......Oil City, Pa.
H. J. Bookhammer, *M. M*......Oil City, Pa.
John Monks, *M. C. B*......Oil City, Pa.
C. E. Turner, *M. M*......Olean, N. Y.
Burlington, Cedar Rapids & Northern Ry
4-8½ g. 713 m. 76 lo. 3,006 cars.
C. J. Ives, *Pres*......Cedar Rapids, Ia.
Robt. Williams, *Gen. Supt*...Cedar Rapids, Ia.
T. Stickney, *Pur. Agt*......Cedar Rapids, Ia.
R. W. Bushnell, *M. M. & C. B.* Cedar Rapids, Ia.
Burlington & Lamoille R. R. 4-8½ g. 35 m. 4 lo. 64 c.
G. L. Linsley, *Gen. Man. & Supt.* Burlington, Vt.
F. G. Brownell, *M. M., M. C. B. & P. A.* do.
Burlington & Mo. Riv. R. R. (in Neb.) (*See C. B. & Q.*)
Burlington & North-West'n Ry. 3 g. 38 m. 3 lo. 97 c.
Burlington & Western R. R. 3 g. 15 m. 38 c.
W. B. Jones, *Supt*......Burlington, Ia.
Burlington & Ohio River R. R. 4-8½ g.
R. Tanner, *Pur. Agt*......Chicago, Ill.

C

California Northern R. R. 4-8½ g. 26 m. 2 lo. 17 c.
Andrew J. Binney, *Gen. Man*..Marysville, Cal.
California Southern R. R. 4-8½ g. 127 m. 13 lo. 301 c.
J. N. Victor, *Supt*......National City, Cal.
J. M. Keith, *M. M*......National City, Cal.
Cambridge & Seaford. (*See Penna. R. R.*; (4) *Div.*)
Camden Atlantic R. R. (*See Penna. R. R.*; (2) *Div.*)
Canada Southern Ry. (*See Mich. Cen.*; (2) *Div.*)
Canada Atlantic Ry. 4-8½ g. 82 m.
D. C. Linsley, *Man*......Ottawa, Ont.
M. Donaldson, *M. M*......Ottawa, Ont.
Canadian Pacific R. R. 4-8½ g. 1,742 m. 118 l. 2,726 c.
W. C. Van Horne, *Gen. Man*......Montreal, Que.
T. G. Shaughnessy, *Asst. G. M.* Winnipeg, Man.
T. R. F. Brown, *Mech. Supt*......Montreal, Que.
T. G. Shaughnessy, *Pur. Agt*......Montreal, Que.
E. Div.: Archer Baker, *Gen. Supt.* Montreal, Can.
Tho. Irwin, *Mech. Supt*......Brockville, Ont.
W. Div.: J. M. Egan, *Gen. Supt*..Winnipeg, Man.
F. C. Butterfield, *M. M. & M. C. B.* Winnipeg, Man.
Cape F'r & Yadkin Val. R. R. 4-8½ g. 112 m. 7 lo. 60 c.
J. S. Morrison, *Gen. Supt*......Fayetteville, N. C.
Isaac W. Clark, *M. M. & C. B*..Fayetteville, N. C.
Cape Girardeau Southwestern Ry.
4-8½ g. 33 m. 3 lo. 20 cars.
Louis Houck, *Gen. Man*..Cape Girardeau, Mo.
W. A. Penney, *Gen. Supt*..Cape Girardeau, Mo.
W. H. Wheeler, *Pur. Agt.* Cape Girardeau, Mo.
Fred Glover, *M. M*......Cape Girardeau, Mo.
Carolina Central R. R. (*See Ral. & Aug.*)
Carson & Colorado R. R. (*See Va. & Truckee*).
Catasauqua & Fogelsville. 4-8½ g. 25 m. 6 lo. 581 c.
C. W. Chapman, *Supt. & P. A.* Catasauqua, Pa.
J. Thomas, *M. M*......Hokendauqua, Pa.
Chas. J. Holbach, *M. C. B*......Catasauqua, Pa.
Catskill Mountain R. R. 3 g. 16 m. 2 lo. 26 cars.
Charles A. Beach, *Supt*......Catskill, N. Y.
Cazenovia, Canastota & De Ruyter. (*See U., I. & E.*)
Central and South-Western Railroads (Ga.).
5 g. 1,115 m. 145 lo. 2,008 cars.
W. G. Raoul, *Pres*......Savannah, Ga.
Wm. Rogers, *Gen. Supt*......Savannah, Ga.
C. H. Carson, *Pur. Agt*......Savannah, Ga.
Cen. Div.: D. D. Arden, *M. M*......Savannah, Ga.
T. F. Warwick, *M. M*......Augusta, Ga.
F. Devine, *M. C. B*......Savannah, Ga.
So.-West'n Div.: T. D. Kline, *Supt*......Macon, Ga.
D. M. Gugel, *M. M*......Macon, Ga.
James A. Knight, *M. C. B*......Macon, Ga.
Central R. R. of N. J. (*See Phil. & Read.; N. J. Cen. Div.*)
Central R. R. of S. C. (*See Wil. & Wel.*)
Central American & Pacific Ry. 3 g. 67 m. 1 lo. 11 c.
W. C. Fitzsimmons, *Gen. Supt*..Escuntla, Guat.
Central Branch Union Pac. (*See Mo. Pac.*; (3) *Div.*)
Central Iowa Ry. 4-8½ g. 412 m. 50 lo. 1,950 cars.
E. L. Dudley, *Supt*......Marshalltown, Ia.
J. G. Johnston, *Asst. Supt*...Marshalltown, Ia.
D. D. Phelps, *Asst. Supt*......Monmouth, Ill.
W. R. Coppock, *Asst. Pur. Agt.* Marshalltown, Ia.
John Player, *M. M*......Marshalltown, Ia.
T. L. Seevers, *M. C. B*......Marshalltown, Ia.
Central Ontario Ry. 4-8½ g. 33 m. 4 lo. 66 cars.
G. W. McMullen, *Gen. Man*......Picton, Ont.
James Falconar, *M. M*......Trenton, Ont.
Central Pac. R. R. 4-8½ g. 4,303 m. 382 lo. 11,260 c.
A. N. Towne, *Gen. Man*...San Francisco, Cal.
J. A. Fillmore, *Gen. Supt*...San Francisco, Cal.
R. H. Pratt, *A. G. Supt*...San Francisco, Cal.
J. R. Watson, *Gen. Pur. Agt*..Sacramento, Cal.
A. J. Stevens, *Gen. M. M*......Sacramento, Cal.
W. McKenzie, *Asst. G. M. M*..Sacramento, Cal.
Benj. Welch, *Gen. M. C. B*......Sacramento, Cal.
G. J. Turner, *Asst. G. M. C. B.* Sacramento, Cal.
Western: Visalia & Tulare Divs. and Northern Ry.
A. D. Wilder, *Supt*......W. Oakland, Cal.
G. D. Welch, *M. M.* (W. Div.) W. Oakland, Cal.
W. B. Ludlow, *M. C. B.* (W. Div.) do.
S. Johnson, *M. M.* (T. Div.)......Tulare, Cal.
D. Rutherford, *M. M.* (N. Rd.). S. Vallejo, Cal.
Sacramento; Oregon Divs.; and Cal. Pac. R. R.
J. B. Wright, *Supt*......Sacramento, Cal.
M. W. Cooley, *M. M.* (*S. Div.*) Sacramento, Cal.
Truckee Div.: J. H. Whited, *Supt.* Wadsworth, Nev.
Geo. Gregg, *M. M*......Wadsworth, Nev.
Wm. McPherson, *F. Car Sh*..Wadsworth, Nev.
Humb't Div.: G. W. Coddington, *Supt.* Carlin, Nev.
W. F. Smith, *M. M*......Carlin, Nev.
J. C. Doughty, *For. Car Sh*......Carlin, Nev.
Salt Lake Div.: A. G. Fell, *Supt*......Ogden, Utah.
James Lamb, *M. M*......Terrace, Utah.
A. Sherburne, *For. Car Sh*......Ogden, Utah.
Colorado Div.: E. E. Hewitt, *Supt*...Needles, Cal.
St. & Cop. R. R.: R. L. Myrick, *Supt*..Stockton, Cal.
Los Angeles; and Yuma Divs. (So. Pac.):
E. E. Hewitt, *Asst. Supt*......Los Angeles, Cal.
James Velsir, *M. M*......Los Angeles, Cal.
T. T. Gilleland, *For. Car Sh.* Los Angeles, Cal.
Arizona Divs (So. Pac.):
J. A. Muir, *Asst. Supt*......Tucson, Ariz.
W. F. Smith, *M. M*......Tucson, Ariz.
Rio Grande (S. Pac.) & El Paso (G. H. & S. A.) Divs.:
C. B. Seymour, *Supt*......El Paso, Texas.
J. L. Bonner, *M. M*......El Paso, Texas.
H. C. Standish, *For. Sh*......El Paso, Texas.
Galveston, Harrisburg & San Antonio System.
E. G. Thompson, *Supt*......Houston, Tex.
San Anto. Div.: W. G. Van Vleck, *Supt*., and
J. J. Ryan, *M. M*......San Antonio, Tex.
D. T. Davis, *Supt. Car Shops.* Harrisburg, Tex.
Louisiana Div.: W. Irwin, *Supt*......Houston, Tex.
D. C. Smith, *M. M*......Houston, Tex.
El Paso Div.: Jas. Campbell, *Supt*..El Paso, Tex.
J. L. Bonner, *M. M*......El Paso, Tex.
Central Texas & N'w'n R. R. (*See Hous. & Tex. Cen.*)
Central Vermont R. R. 4-8½ g. 673 m. 136 lo. 2,789 c.
J. W. Hobart, *Gen. Man*......St. Albans, Vt.
J. M. Foss, *Asst. Gen. Supt. & M. M.* St. Albans, Vt.
No. Div.: I. B. Futvoye, *Supt*......St. Johns, P. Q.
Rut. Div.: J. Burdett, *Supt*......Rutland, Vt.
N. L. Davis, *M. M. & C. B*......Rutland, Vt.
Brattleboro & Whitehall R. R., and
Brat. Div.: E. F. Brooks, *Supt*...Brattleboro, Vt.
New London No'n R. R. 143 m. 22 lo. 303 c.
C. F. Spaulding, *Supt. & P. A.* New London, Ct.
I. W. Dow, *M. M*......New London, Ct.
S. O. Banks, *M. C. B*......New London, Ct.
Chagrin Falls & Southern R. R. 3 g. 6 m. 1 lo. 12 c.
W. Hutchings, *Gen. Man*......Chagrin Falls, O.
J. W. Williams, *Gen. Supt*......Chagrin Falls, O.
Charleston & Savannah Ry. 5 g. 115 m. 17 lo. 190 c.
H. S. Haines, *Gen. Man*......Savannah, Ga.
C. S. Gadsden, *Gen. Supt*......Charleston, S. C.
H. A. Ulmo, *M. M*......Savannah, Ga.
Charlotte, Columbia & Augusta R. R. (*See Rich. & D.*)
Chateaugay R. R. 3 g. 34 m. 7 lo. 365 cars.
A. L. Inman, *Gen. Man*......Plattsburg, N. Y.
J. M. Davies, *Supt*......Lyon Mountain, N. Y.
M. L. French, *Asst. Supt*......Plattsburg, N. Y.
Chattaroi Ry. 4-8½ g. 51 miles 11 loco. 483 cars.
F. H. Oliphant, *Gen. Man. & P. A.* Ashland, Ky.
J. R. Martin, *M. M*......Ashland, Ky.
Joseph P. Burleigh, *M. C. B*......Ashland, Ky.
Cheraw & Chester R. R. (*See Rich. & Dan.*; (2) *Div.*)
Cheraw & Darlington R. R. (*See Wil. & Wel.*)
Cheraw & Salisbury R. R. (*See Wil. & Wel.*)
Cherokee R. R. (*See East & West.*)
Cherry Valley R. R. 4-8½ g. 6 m. 3 lo. 6 cars.
E. T. Herndon, *Supt*......Midland, Mo.
Chesapeake, Ohio & South-Western.
4-9 g. 398 m. 62 lo. 1,345 c.
Gen. Supt......Louisville, Ky.
H. E. Huntington, *Pur. Agt*......Louisville, Ky.
J. E. Reeves, *Supt. Trans*......Louisville, Ky.
R. H. Briggs, *Supt. M. P*......Paducah, Ky.
D. L. Weaver, *M. M*......Elizabethtown, Ky.
Jno. Fitzgerald, *M. M*......Paducah, Ky.
Chesapeake & Ohio Ry. 4-8½ g. 642 m. 169 l. 5,120 c.
C. W. Smith, *Gen. Man*......Richmond, Va.
D. A. Sweet, *Asst. to Gen. Man.* Richmond, Va.
A. S. Emmons, *Pur. Agt*......Richmond, Va.
T. L. Chapman, *Supt. M. P*......Richmond, Va.
Eastern Div.: A. H. Wood, *Supt*..Richmond, Va.
J. N. King, *M. C. B*......Richmond, Va.
J. B. Pierce, *M. M*......Richmond, Va.
Hunt. Div.: W. B. Ryder, *Supt*....Hinton, W. Va.
W. H. Thomas, *M. M*...Huntington, W. Va.
H. C. Bassinger, *M. C. B.* Huntington, W. Va.
Lex. Div.: J. D. Yarrington, *Supt*..Lexington, Ky.
S. R. Tuggle, *M. M*......Lexington, Ky.
K. C. Div.: G. W. Bender, *Supt*..Lexington, Ky.
A. H. Watts, *M. M*......Lexington, Ky.
Cheshire R. R. 4-8½ g. 80 m. 31 lo. 531 cars.
R. Stewart, *Gen. Man*......Keene, N. H.
H. H. Stone, *Pur. Agt*......Keene, N. H.
F. A. Perry, *M. M*......Keene, N. H.
A. E. Howard, *M. C. B*......Keene, N. H.
Chester & Lenoir Ry. (*See Rich. & Dan.*; (3) *Div.*)
Chicago, Bur. & Kan. City Ry. (*See C. B. & Q.*)
Chicago, Burlington & Quincy R. R.
4-8½ g. 3,608 m. 545 lo. 21,012 cars.
T. J. Potter, *Gen. Man*......Chicago, Ill.
(1) C., B. & Q., East of Mo. Riv.
H. B. Stone, *Asst. Gen. Man*......Chicago, Ill.
Wm. Irving, *Gen. Pur. Agt*......Chicago, Ill.
G. W. Rhodes, *Supt. M. P*......Aurora, Ill.
Wm. Forsyth, *Mech. Eng*......Aurora, Ill.
Ill. Divs.: J. D. Besler, *Supt*......Galesburg, Ill.
Chi. Div.: Geo. Alexander, *Supt*......Aurora, Ill.
L. E. Johnson, *M. M*......Aurora, Ill.
Galesburg Div.: F. C. Rice, *Supt.* Galesburg, Ill.
Robert Colville, *M. M*......Galesburg, Ill.
St. L. Div.: W. C. Brown, *Supt*..Beardstown, Ill.
A. Forsyth, *M. M*......Beardstown, Ill.
Ia. & Mo. Divs.: W. F. Merrill, *Supt.* Burlington, Ia.
East. Div.: O. E. Stewart, *Supt*..Burlington, Ia.
Joel West, *M. M*......Burlington, Ia.
Mid. Div.: J. B. Maxon, *Supt*......Ottumwa, Ia.
West'n Div.: J. H. Duggin, *Supt*......Creston, Ia.
C. W. Eckerson, *M. M*......Creston, Ia.
Chi., B. & Kan. C'y and St. L., Keo. & No.-W'n Rys.
Robt. Law, *Gen. Supt*......Keokuk, Ia.
W. H. Bartlett, *M. M*......Burlington, Ia.
(2) C. B. & Q., West of Mo. Riv.
G. W. Holdrege, *Asst. Gen. Man.* Omaha, Neb.
C. M. Wead, *Supply Agt*......Omaha, Neb.
D. Hawksworth, *M. M*......Plattsmouth, Neb.
C. M. Wead, *Storek'pr*......Plattsmouth, Neb.
Bur. & Mo. Riv. & Neb. Ry. Divs.:
T. E. Calvert, *Gen. Supt*......Lincoln, Neb.
D. E. Thompson, *Supt*......Lincoln, Neb.
E. Bignell, *M. M*......Lincoln, Neb.
R. V. Div.: A. Campbell, *Supt*......McCook, Neb.
A. & N. Div.: J. McConniff, *Supt*...Lincoln, Neb.
Chicago, Fairchild & Eau Claire R. R.
4-8½ g. 20 m. 3 lo. 28 cars.
N. C. Foster, *Gen. Man*......Fairchild, Wis.
C. I. Wickersham, *Pur. Agt*......Chicago, Ill.
Chicago, Milwaukee & St. Paul R. R.
4-8½ g. 5,201 m. 626 lo. 19,018 cars.
S. S. Merrill, *Gen. Man*......Milwaukee, Wis.
R. Miller, *Asst. Gen. Man*......Milwaukee, Wis.
J. T. Clark, *Gen. Supt*......Milwaukee, Wis.
A. J. Earling, *Asst. Gen. Supt.* Milwaukee, Wis.
J. T. Crooker, *Pur. Agt*......Milwaukee, Wis.
J. M. Lowry, *Gen. M. M*......Milwaukee, Wis.
E. Fairbairn, *M. M*......Milwaukee, Wis.
John Baillie, *Supt. Car Dept*...Milwaukee, Wis.
W. E. Kittridge, *M. C. B*......Milwaukee, Wis.
(1) C. & C. B. Div. in Ill.:
G. O. Clinton, *Supt*......Chicago, Ill.
La Crosse Div.: W. G. Collins, *Supt.* Milwaukee, Wis.
P. du C. & M. Pt. Divs.:
S. J. Collins, *Supt*......Milwaukee, Wis.
(2) C. H. Prior, *Asst. Gen. Supt*..Minneapolis, Minn.
H. & D. Div.: W. M. Kellie, *Supt* do.
J. O. Pattie, *M. M*......Minneapolis, Minn.
Ia. & Minn. Div.: H. R. Williams, *Supt.* do.
S. Minn. Div.: F. D. Underwood, *Supt.* Lacrosse, Wis.
Riv. & Dub. Divs.: C. W. Case, *Supt.* Dubuque, Ia.
S. Charnley, *M. M*......Dubuque, Ia.
Ia. & Da. Div.: G. W. Sanborn, *Supt.* Mason City, Ia.
S. Cy. & Da. Div.: W. J. Underwood, *Supt.* Sioux Cy, Ia.
F. H. Moulton, *M. M*......Yankton, Dak.
J. M. Horan, *For*......Yankton, Dak.
(3) D. A. Olin, *Asst. Gen. Supt*......Racine, Wis.
R. & S. W. Divs.: D. L. Bush, *Supt*...Racine, Wis.
John Taylor, *M. M*......Racine, Wis.
(4) Northern Div.: L. B. Rock, *Supt.* Milwaukee, Wis.
Wm. E. Kittredge, *M. C. B*..Milwaukee, Wis.
Chicago, Rock Island & Pac. Ry.
4-8½ g. 1,381 m. 309 lo. 8,367 cars.
R. R. Cable, *Pres. & Gen. Man*......Chicago, Ill.
A. Kimball, *V. P. & Gen. Supt*......Chicago, Ill.
H. F. Royce, *Asst. G. Supt*......Davenport, Ia.
F. A. Marsh, *Pur. Agt*......Chicago, Ill.
T. B. Twombly, *Gen. M. M*......Chicago, Ill.
B. K. Verbryck, *Gen. M. C. B*......Chicago, Ill.
Ill. Div.: R. H. Chamberlin, *Supt*......Chicago, Ill.
R. Biester, *M. M*......Chicago, Ill.
Sam'l Pullman, *M. C. B*......Chicago, Ill.
Ia. Divs.: Jno. Given, *Supt*......Des Moines, Ia.
J. G. Crockett, *M. M*......Stuart, Ia.
Jas. E. Morrill, *M. M*......Davenport, Ia.
Chas. M. Leonard, *M. C. B*......Davenport, Ia.
K. & Des. M. Div.: Jno. Given, *Supt*..Des Moines, Ia.
S. W. Wakefield, *M. M*......Keokuk, Ia.
Henry Kummer, *M. C. B*......Keokuk, Ia.
So.-Wn. Div.: G. F. Walker, *Supt*......Trenton, Mo.
R. O. Carscadin, *M. M*......Trenton, Mo.
Chas. R. Best, *M. C. B*......Trenton, Mo.
Chicago, Saginaw & Canada R. R. (*See Det., L. & N.*)
Chicago, St. Louis & New Orleans R. R. (*See Ill. Cen.*)
Chicago, St. Louis & Pittsburg R. R.
4-9 g. 635 m. 202 lo. 3,510 cars.
James McCrea, *Manager*......Columbus, O.
Wm. Mullins, *Gen. Pur. Agt*......Pittsburg, Pa.
Edward B. Wall, *Supt. M. P*......Columbus, O.
1, 3 & 5 Divs.: J. F. Miller, *Supt.* Richmond, Ind.
Robert Curtis, *M. M*......Columbus, O.
J. L. Copeland, *G. F. Car Shops.* Columbus, O.
W. C. Arp, *Gen. For*......Indianapolis, Ind.
2 & 4 Divs.: Chas. Watts, *Supt.* Logansport, Ind.
W. W. Reynolds, *M. M*......Logansport, Ind.
Chas. H. Starr, *G. F. C. Shops*, Logansport, Ind.
Chicago, St. Louis & Wn. R. R. 4-8½ g. 88 m. 11 lo. 1,799 c.
F. E. Hinckley, *Gen. Man*......Chicago, Ill.
A. H. Crocker, *Supt*......Streator, Ill.
J. N. Chilson, *M. C. B*......Streator, Ill.
Chicago, St. Paul, Minneapolis & Omaha Ry.
4-8½ g. 1,280 m. 181 lo. 5,221 cars.
J. M. Whitman, *Gen. Supt*......St. Paul, Minn.
W. H. S. Wright, *Pur. Agt*......St. Paul, Minn.
Matt. Ellis, *M. M*......St. Paul, Minn.
J. J. Ellis, *Asst. M. M*......St. Paul, Minn.
H. L. Preston, *M. C. B*......Hudson, Wis.
Ea. & No. Div.: A. A. Hobart, *Supt.* St. Paul, Minn.
St. Paul and Sioux City Div.:
H. Spencer, *Supt*......St. James, Minn.
H. C. Anderson, *Asst. M. M*......Sioux Cy, Ia.
Neb. Div.: Jas. McCabe, *Supt*......Omaha, Neb.
Chic., Tex. & Mexican Cent. Ry. (*See Gulf, C. & S. F.*)
Chicago & Alton R. R. 4-8½ g. 849 m. 213 lo. 6,168 c.
C. H. Chappell, *Gen. Man*......Chicago, Ill.
T. L. Bates, *Supt. of Trans*...Bloomington, Ill.
A. V. Hartwell, *Pur. Agt*......Chicago, Ill.
Wm. Wilson, *Supt. of Mach*...Bloomington, Ill.
Jos. Townsend, *G. For. Car Dept.* do.
Chi. Div.: A. M. Richards, *Supt.* Bloomington, Ill.
St. L. & K. C. Div.: S. D. Reeves, *Supt.* Roodhouse, Ill.
L. H. Miller, *M. M*......Slater, Mo.
Chicago & Atlantic Ry. 4-8½ g. 269 m.
F. Broughton, *Gen. Man*......Chicago, Ill.
J. H. Parsons, *Supt*......Chicago, Ill.
Geo. A. Hill, *M. M. & M. C. B*..Huntington, Ill.
Chi. & East'n Ill. 4-8½ g. 252 m. 56 lo. 3,500 cars.
O. S. Lyford, *Gen. Supt*......Chicago, Ill.
D. R. Patterson, *Pur. Agt*......Chicago, Ill.
P. W. Drew, *M. Trans*......Chicago, Ill.
Allen Cooke, *M. M*......Danville, Ill.
Chicago & Grand Trunk Ry. (*See Grand Trunk.*)
Chicago & Great Southern Ry.
4-8½ g. 124 m. 4 lo. 122 c.
Henry Crawford, *Gen. Man*......Chicago, Ill.
H. Crawford, Jr., *Supt*......Chicago, Ill.
Chicago & Iowa R. R. 4-8½ g. 104 m. 16 lo. 237 cars.
T. J. Potter, *Gen. Man*......Chicago, Ill.
W. H. Holcomb, *Gen. Supt*......Rochelle, Ill.
H. S. Bryan, *M. M*......Aurora, Ill.
Chicago & Northwestern Ry.
4-8½ g. 3,761 m. 637 lo. 21,000 cars.
Marvin Hughitt, *2d V. Prs. & G. M.* Chicago, Ill.
C. C. Wheeler, *Gen. Supt*......Chicago, Ill.
W. B. Linsley, *Ass't Gen. Supt*......Chicago, Ill.
R. W. Hamer, *Pur. Agt*......Chicago, Ill.
Geo. W. Tilton, *Supt. M. P. & M.*; and
Wm. Campbell, *A. Supt. M. P. & M.* Chicago, Ill.
Wis. and Mil. Divs. & Sheboygan & W'n Ry.:
Ed. J. Cuyler, *Supt*......Chicago, Ill.
Gal. Div.: Chas. Murray, *Supt*......Chicago, Ill.
Pen'a Div.: W. F. Fitch, *Supt*......Escanaba, Mich.
J. Symons, *M. M*......Escanaba, Mich.
Mad. Div.: C. A. Swineford, *Supt*..Baraboo, Wis.
Minn. & Dak. Divs.: S. Sanborn, *Asst. Gen. Supt.*
and W. A. Scott, *M. M*......Winona, Minn.
Dak. Cen. Ry.: J. S. Oliver, *Supt*......Huron, Dak.
Ia. Div.: H. G. Burt, *Supt*......Boone, Ia.
Geo. W. Lowe, *M. M*......Clinton, Ia.
No. Ia. Div.: M. Hopkins, *Supt*...Eagle Grove, Ia.
Win. & St. P. Div.:
W. P. Cosgrave, *Supt*......Winona, Minn.
Chicago & West Michigan:
4-8½ g. 409 m. 47 lo. 1,629 cars.
J. B. Mulliken, *V. P. & G. Man.* Muskegon, Mich.
A. M. Nichols, *Gen. Supt*......Gd. Rapids, Mich.
Allen Bourne, *Pur. Agt*......Detroit, Mich.
W. F. N. Davis, *M. M*......Muskegon, Mich.
Chicago & West'n Ind. R. R. 4-8½ g. 50 m. 12 lo. 150 c.
James D. Carson, *Gen. Man*......Chicago, Ill.
Cincinnati, Columbus & Hocking Val. Ry.
4-9 g. 25 m. 2 lo. 77 cars.
D. P. Hyatt, *Gen. Man*......Dayton, O.
Cin., Georgetown & Portsmouth. 3 g. 35 m. 3 lo. 45 c.
M. Simmons, *Supt*......Cincinnati, O.
F. Enler, *M. M*......Cincinnati, O.
Cincinnati & Green River Ry. 3 g. 11 m. 2 lo. 41 c.
G. B. Harper, *Supt*......Grove, Ky.
Geo. W. Lewis, *M. M*......Grove, Ky.
Cin., Hamilton & Dayton R. R. 4-9 g. 352 m. 92 l. 2,932 c.
C. J. Hepburn, *Gen. Supt*......Cincinnati, O.
W. F. Stark, *Asst. Supt*......Toledo, O.
John Black, *Gen. M. M*......Lima, O.
W. H. H. Allison, *M. C. B*......Cincinnati, O.
Day. & Mich. Div.:
Cincinnati, Indianapolis, St. Louis & Chicago Ry.
4-8½ g. 384 m. 71 lo. 3,279 cars.
J. W. Sherwood, *Supt*......Indianapolis, Ind.
Geo. Tozzer, *Pur. Agt*......Cincinnati, O.
J. S. Patterson, *M. of Mach. & M. C. B.* Cincinn., O.
Cincinnati, New Orleans & Texas Pacific Ry. Co.
5 g. 846 m. 123 lo. 3,464 cars.
John Scott, *Gen. Man*......Cincinnati, O.
Richard Carroll, *Gen. Supt*......Cincinnati, O.
R. W. Healey, *Gen. Pur. Agt*......Cincinnati, O.
James Meehan, *S. M. P. & M*......Cincinnati, O.
Cin. So. Div.: W. W. Wells, *Supt*..Somerset, Ky.
J. L. Tomlinson, *Asst. S. M. P*..Ludlow, Ky.
John Richardson, *M. C. B*......Cincinnati, O.
A. Thomson, *M. M*......Chattanooga, Tenn.
Ala. Gr. S'n Div.: D. McLaren, *Supt*., and
George Manuell, *M. M*...Chattanooga, Tenn.
J. M. Kelly, *M. C. B*......Chattanooga, Tenn.
V. & M. Div.: E. F. Raworth, *Supt*., and
M. M......Vicksburg, Miss.
V. S. & P. Div.: F. Y. Dabney, *Supt.* Monroe, La.
W. Bell Smith, *M. M. & C. B*......Monroe, La.
New Orleans & North-Eastern R. R.

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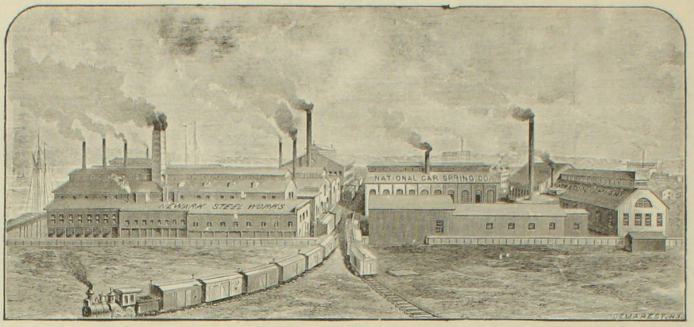
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HOPKINS VERSUS LE ROY!

THE QUESTION.

Does the Le Roy Journal Bearing Company "stand ready" to make what are commonly known as Hopkins Journal Bearings, because of numerous disgusting failures, resulting from the use of the weak, gridiron arrangement known as the Le Roy Bearing heretofore made and sold by them, and the consequent necessity of going out of business or giving their customers a really good bearing even if they have to "pirate" the invention for which a patent was granted to Hopkins that has been declared valid by both the Eastern and Western Railroad Association?

Does the Le Roy Company expect to build up a business by infringing Hopkins' Patent, and selling bearings, and a lawsuit with them?

In the recent interference patent fight between Hopkins and Le Roy, the Commissioner of Patents, in his final decision, which was rendered August 31, 1883, says:

"On the broad claim, as well as the specific claim covering the device embodying not only the broad but the specific invention of a journal bearing with a soft metal lining, with ridges or projections so arranged that, upon being brought in contact with the axle, the ridges or projections will yield and spread out so as to make a perfectly-fitting box, priority of invention must be awarded to Hopkins."

As to the specific arrangement for which priority of invention was awarded to Le Roy, all will perceive that the broad claim for which priority of invention is awarded to Hopkins, and the very broad claim embodied in the patent granted him Oct. 16, 1883, in the following words: "A Journal Bearing made of two different metals, one of soft or yielding nature, and the other of a hard or unyielding nature, the soft or yielding carrying ridges or spurs which receive the initial pressure of the journal, and by the rolling action of the same and the load pressure upon the bearing becomes crushed down and spread in conformity with the contour thereof, as described, whereby the surfaces in wearing contact are adjusted to each other, substantially as specified,"

COVERS THE WHOLE CASE

As to his being the prior inventor of Bearings with soft metal ridges for receiving the Initial pressure of the Journal, and leaves him absolute master of the situation.

AN OLD ADAGE SAYS:
"SUE A BEGGAR AND CATCH A LOUSE."

Will Mr. McLean, of the so-called Le Roy Journal Bearing Co., give to Mr. Hopkins and to Railroad Companies and Car-Builders any reliable proof that his Company is in reality anything else than an irresponsible piratical concern (see his advertisement) that is absolutely judgment proof, and any guarantees it may offer against suits by Hopkins are not perfectly worthless, and in so doing will he talk plain, honest common sense, instead of craftily stringing together a lot of words (see his advertisement) that mean nothing unless they mislead?

No invention ever did or can infringe any patent. It is not the invention in any case that infringes, but the making, selling or using of a thing patented without the right to do so. Talk about making an offer to settle a point that does not exist is as cheap as it is misleading and worthless.

All parties are hereby warned that my rights under said Letters Patent will be enforced.

D. A. HOPKINS, Patentee and Manufacturer,

113 Liberty Street, - - - - New York.

VAN DUSEN PATENT NUT LOCK.

A Perfect Nut Lock, Cheaper and Better than Jamb Nuts, or even Wooden Washers.

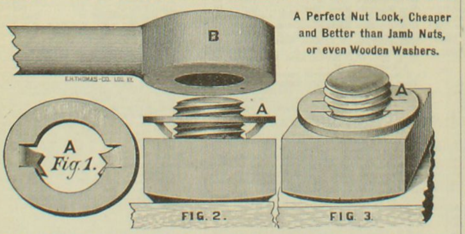

Fig. 1.—*A*, represents nut lock detached. Fig. 2.—*A*, nut lock in position, ready to apply; *B*, the tool used in setting the lock—it is simply a bar of iron having a hole ⅛ inch larger than the bolt—when placed as indicated one or two smart blows with a hammer on the tool force the lock flat, the teeth entering the metal of the bolt. Fig. 3.—*A*, represents the lock applied.

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Geo. L. Barringer, *Gen. Man*....Cincinnati, O.
Cincinnati, Selma & Mobile R.R. 5 g. 71 m. 6 lo. 148 c.
A. McCollister, *Supt*...............Selma, Ala.
H. L. Wright, *Pur. Agt*.............Selma, Ala.
J. M. Levis, *M. M*.... ....Marion, Ala.
Cincinnati, Van Wert & Michigan R. R.
4-9 g. 81 m. 7 lo. 168 cars.
E. Garrison, *Gen. Man*............Van Wert, O.
D. R. Ennis, *Supt. & P. A*........Van Wert, O.
H. H. Garr, *M. M. & M. C. B*.....Van Wert, O.
Cin., Wabash & Mich. Ry. 4-8½ g. 165 m. 13 lo. 402 c.
Norman Beckley, *Gen. Man. & P. A.* Elkhart, Ind.
O. W. Lamport, *Supt*.............Wabash, Ind.
S. B. Tinker, *M. M. & M. C. B*...Wabash, Ind.
Cin., Wash. & Balt. 4-8½ g. 312 m. 65 lo. 1,422 cars
Jas. H. Stewart, *Gen. Man*.......Cincinnati, O.
Edw. Evans, *M. M*..............Chillicothe, O.
T. G. Duncan, *Supt. Car Dept*.......Zaleski, O.
Cincinnati, Wheeling & New York R.R. 4-8½ g. 13 m.
Thos. R. Sharp, *Pres*..........New York, N. Y.
Cincinnati & Eastern Ry. 3 g. 100 m. 7 lo. 133 cars.
S. Woodward, *Gen. Man*.........Cincinnati, O.
G. H. Wilber, *Gen. Sup. & Pur. Agt.* Cincinnati, O.
P. W. Naughton, *M. M*.............Newtown, O.
Cincinnati & South-Eastern Ry. 4-8½ g. 18 m.
John V. Patton, *Gen. Man*.......Newport, Ky.
Clarksburg, Weston & Glenville R. R.
3 g. 26 m. 3 lo. 45 cars.
A. H. Kunst, *Pres. & Gen. Man.* Weston, W. Va.
Sam. A. Steel, *M. M*............Weston, W. Va.
F. Dillie, *M. C. B*..............Nottingham, O.
Cleveland, Columbus, Cincinnati & Indiana and Indianapolis & St. Louis Rys. and Dayton & Union R. R. 4-8½ g. 785 m. 246 lo. 7,988 cars.
E. B. Thomas, *Gen. Man*.........Cleveland, O.
J. L. Yale, *Pur. Agt*..............Cleveland, O.
W. F. Turreff, *Gen. M. M*.........Cleveland, O.
Col. & Cin. Div.: Robt. Blee, *Supt*. Cleveland, O.
Wm. Garsting, *M. M*.............Cleveland, O.
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Ind'p'lis Div.: John O. Ewan, *Supt*. Ind'polis, Ind.
T. W. Ranson, *M. M*.........Brightwood, Ind.
N. Mark, *G. For. Car Dept*. Brightwood, Ind.
Ind. & St L Ry.: Tho. Burrows, *Supt*. St. Louis, Mo.
T. W. Ranson, *M. M. & C. B.* Brightwood, Ind.
Day. & Un. Rd.: J. H. Barrett, *Supt*. Cincinnati, O.
H. S. Gordon, *For. M. Shops*.......Dayton, O.
Clevel'd, Delphos & St. Louis R.R. 3 g. 56 m. 3 lo. 39 c.
I. H. Burgoon, *Gen. Man*..........Delphos, O.
B. F. Marshall, *M. M*...............Delphos, O.
Cleveland, Indiana & St. Louis R. R.
4-8½ g. 19 m. 2 lo. 20 cars.
J. A. Larned, *Rec. & Supt*......Anderson, Ind.
Cleveland, Mt. Vernon & Delaware R. R.
4-9 g. 144 m. 24 lo. 828 c.
N. Monsarrat, *Gen Supt*..............Akron, O.
G. M. Taylor, *M. M. & C. B*.....Mt. Vernon, O.
Cleve., Youngstown & Pitts. R. R. 3 g. 30 m. 3 lo 138 c.
D. T. Lumley, *Gen. Supt*..........Alliance, O.
C. H. Dorman, *M. M. & M. C. B*....Alliance, O.
Cleveland, Lorain & Wheeling Ry.
4-8½ g. 158 m. 31 lo. 1,878 cars.
Oscar Townsend, *Gen. Man*......Cleveland, O.
Wm. Thornburg, *Supt*.................Lorain, O.
W. A. Stone, *M. M*....................Lorain, O.
Cleve. & Marietta R. R. (*See Wheel. & Lake Erie.*)
Cleveland & Pittsburg. (*See Penna. Co.; (4) Div.*)
Clifton & Port Hudson R. R. 4-8½ g. 22 m. 3 lo. 12 c.
D. W. Pipes, *Supt*.................Clinton, La.
W. F. Lockwood, *M. M*...........Clinton, La.
Clove Branch R. R. 4-8½ g. 4 m. 1 lo. 61 cars.
C. L. Kimball, *Supt*...........Mattewan, N. Y.
W. G. Vanbuskirk, *M. M*...Dutchess Jc., N. Y.
Coburg, Peterborough & Marmora Ry.
5-6 g. 47 m. 5 lo. 255 cars.
Jas. R. Barber, *Gen. Supt*.......Cobourg, Ont.
Jas. Clark, *M. M*..............Cobourg, Ont.
John Tinney, *M. C. B*............Cobourg, Ont.
Colorado Central R. R. (*See Un. Pac.; (4) Div.*)
Columbia & Greenville R. R. (*See Rich. & D.; (3) Div.*)
Columbia & Puget Sound R.R. 3 g. 21 m. 7 lo. 114 c.
J. L. Howard, *Gen. Supt*.. San Francisco, Cal.
Columbus, Hocking Valley & Toledo Ry.
4-9 g. 324 m. 90 lo. 7,353 cars.
G. R. Carr, *Gen. Supt*.............Columbus, O.
W. M. Greene, *Pur. Agt*...........Columbus, O.
Ira G. Hutchins, *M. M*............Columbus, O.
J. M. Rockafield, *M. C. B*.........Columbus, O.
Tol. Div.: M. T. Seymour, *Supt*......Columbus, O.
Hock. V. Div.: M. P. L. Booth, *Supt*. Columbus, O.
Ohio Riv. Div.: C. D. Norris, *Supt*.......Logan, O.
Columbus & Eastern R. R. In progress
J. E. Redfield, *Pres*...........Columbus, Ohio.
Columbus & Maysville Ry. (*See Cin. & East.*)
Columbus & Rome R. R. 3 g. 33 m. 3 lo. 30 cars.
M. E. Gray, *Supt*...............Columbus, Ga.
Columbus & Western Ry. 5 g. 89 m. 6 lo. 53 cars
E. A. Flewellen, *Gen. Man*.......Columbus, Ga.
R. A. Bridges, *M. M*..............Opelika, Ala.
Concord R. R. 4-8½ g. 141 m. 38 lo. 1,235 cars.
H. E. Chamberlain, *Supt. & P. Agt*. Concord, N.H.
J. T. Gordon, *M. M. & C. B*......Concord, N. H.
Concord & Claremont R. R. (*See Northern of N. H.*)
Conn. Riv. and Ver. Val. R. Rs. 4-8½ g. 130 m. 42 lo. 554 c.
J. Mulligan, *Supt. & Pur. Agt*. Springfield, Mass.
W. H. Stearns, *M. M. & M. C. B*. Springfield, Mass.
Conn. & Passumpsic Rivers R. R. (*See Passumpsic.*)
Connotton Valley R. R. 3 g. 160 m. 26 lo. 997 cars.
Samuel Briggs, *Gen. Man*........Cleveland, O.
B. C. Bosworth, *M. M*...............Canton, O.
Cooperstown & Susquehanna Valley R. R.
4-8½ g. 16 m. 2 lo. 14 cars.
Andrew Shaw, *Pres*.......Cooperstown, N. Y.
A. Mumford, *M. M*........Cooperstown, N. Y.
Corning, Cowanesque & Antrim Ry. (*See Syr., G. & C.*)
Cornwall R. R., 4-8½ g. 12 m. 5 lo. 166 cars
J. M. Havard, *G. Supt. & M. M*....Lebanon, Pa.
Levi Blonch, *M. C. B*...............Lebanon, Pa.
Coudersport & Port Allegheny R. R.
3 g. 17 m. 2 lo. 64 cars.
B. A. McClure, *Gen. Supt*.......Coudersport, Pa.
Credit Valley Ry. 4-8½ g. 184 m. 22 lo. 535 cars.
Wm. Whyte, *Gen. Supt*...........Toronto, Ont.
John Macnab, *Pur. Agt*...........Toronto, Can.
D. Preston, *Mech. Supt*..........Toronto, Can.
Crooked Creek R. R. 3 g. 9 m. 1 lo. 37 cars.
Walter C. Willson, *Gen. Man*. Webster City, Ia.
Geo. W. Post, *Pur. Agt*..............Lehigh, Ia.
Crown Point Iron Co. R. R. 3 g. 13 m. 4 lo. 113 c.
A. L. Inman, *Gen. Man*.......Plattsburg, N. Y.
H. L. Reed, *Pur. Agt*.........Crown Point, N. Y.
J. M. Davies, *Supt. & M. M*..Crown Point, N. Y.
J. C. Sherman, *M. C. B*......Crown Point, N. Y.
Cumberland Ry. 4-8½ g. 32 m. 1 lo. 64 c.
J. A. Killam, *Gen. Man*..........Parsboro, N. S.
K. McKinnon, *M. M*..............Parsboro, N. S.
Cumberland Valley R. R. 4-9 g. 127 m. 25 lo. 474 cars.
J. F. Boyd, *Supt*...........Chambersburg, Pa.
A. S. Hull, *M. M*..........Chambersburg, Pa.
C. Wicke, *M. C. B*..........Chambersburg, Pa.
Cumberland & Maurice River R. R. 4-8½ g. 20 m
L. H. Dowdney, *Supt*.........Port Morris, N. J.
Cumberland & Penn. R. R. 4-8½ g. 55 m. 28 lo. 625 c.
P. L. Burwell, *Gen Supt & P A*. Cumberland, Md.
N. W. Howson, *Mast. of Mach*. Mt. Savage, Md.
Nathan Binix, *M. C. B*.........Mt. Savage, Md.

D

Danville & New River R. R. 3 g. 43 m. 2 lo. 30 c.
W. T. Sutherlin, *Gen. Man*.........Danville, Va.
W. T. Whittaker, *M. M*.............Danville, Va.
Danbury & Norwalk R. R. 4-8½ g. 36 m. 7 lo. 112 c.
C. M. Crawford, *G. Supt. & P. A*. S. Norwalk, Ct.
W. H. Wilkinson, *M. M. & C. B*. Danbury, Conn.
Danville, Mocksville & So.-Wn. R. R. 3 g. 28 m.
H. M. Shivler, *Supt*...........Leakesville, N. C.
Danville, Olney & O. R. R.R. 4-8½ g. 110 m. 5 lo. 83 c.
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Dayton & Union R. R. (*See Clev., Col., Cin. & Ind.*)
Dayton & Michigan R. R. (*See Cin., Ham. & Day.*)
Del. Lackawanna & W. and N. Y., Lack. & W. R. Rs.
4-8½ g. 930 m. 436 lo. 31,989 cars.
Wm. F. Halstead, *Gen. Supt*.......Scranton, Pa.
G. W. B. Cushing, *Pur. Agt*....New York, N. Y.
Walter Dawson, *Mast. of Mach*...Scranton, Pa.
Robt. McKenna, *M. C. B*.............Scranton, Pa.
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Utica Div.: A. C. Salisbury, *Supt*....Utica, N. Y.
Thos. Thatcher, *M. M*...........Utica, N. Y.
Morris & Essex Div.; Sussex; P. & D. and C. R. Rs.
A. Reasoner, *Supt*..............Hoboken, N. J.
W. H. Lewis, *M. M*..........Kingsland, N. J.
J. W. Baker, *Mast. Car Rep*........Dover, N. J.
Oswego & Syracuse Div.:
W. B. Phelps, *Supt*..............Oswego, N. Y.
Jas. Buchanan, *M. M*..........Syracuse, N. Y.
Syracuse, Binghamton & New York R. R.
4-8½ g. 81 m. 20 lo. 598 cars.
W. K. Niver, *Gen. Supt*.........Syracuse, N. Y.
Jas. Buchanan, *M. M*...........Syracuse, N. Y.
Cayuga Div.: W. R. Humphrey, *Supt* Ithaca, N.Y.
Delaware, Maryland & Virginia R. R.
4-8½ g. 101 m. 7 lo. 145 cars.
Tho. Groom, *Supt*......................Lewes, Del.
Geo. Messick, *M. M*...................Lewes, Del.
W. H. Virden, *M. C. B*................Lewes, Del.
Delaware River R. R. 4-8½ g. 20 m. 3 lo. 4 cars.
E. H. Green, *Supt*............Pedricktown, N. J.
Delaware Western R. R. (*See Balt. & Phil.*)
Delaware & Chesapeake R. R. (*See Penna.; (4) Div.*)
Delaware & Hudson Canal Co.
4-3 and 4-8½ g. 634 m. 180 lo. 10,799 cars.
C. F. Young, *Gen. Man*.........Honesdale, Pa.
C. F. Young, *Pur. Agt*..............Albany, N. Y.
R. C. Blackall, *Supt. of Mach*.....Albany, N. Y.
Susq. Div.: C. D. Hammond, *Supt*. Albany, N. Y.
Tho. Howard, *M. M*...........Oneonta, N. Y.
J. R. Skinner, *M. C. B*.........Oneonta, N. Y.
Sar. & Ch. Divs.: T. Voorhees, *Supt*...Troy, N. Y.
J. L. Corey, *M. M*.........Green Island, N. Y.
Chr. Körner, *M. C. B*.....Green Island, N. Y.
Pa. Div.: R. Manville, *Supt & Pur Agt*. and
S. H. Dotterer, *M. M*..........Carbondale, Pa.
T. Orchard, *M. C. B*..........Carbondale, Pa.
Denver Circle R. R. 3 g. 12 m. 7 lo. 15 cars
Theo. C. Henry, *Gen. Man*.........Denver, Col.
J. H. Bedson, *Gen. Supt*...........Denver, Col.
Denver, Utah & Pacific R. R. 3 g. 34 m. 2 lo. 58 c.
L. M. Fouts, *Supt*.....................Denver, Col.
Denver & New Orleans. 4-8½ g. 140 m. 11 lo. 400 c.
C. W. Fisher, *Gen. Man*............Denver, Col.
Chas. Wheeler, *Pur. Agt*..........Denver, Col.
J. H. Kirk, *M. M. & M. C. B*.......Denver, Col.
Denver & Rio Grande Ry. 3 g. 1,665 m. 222 lo. 5,932 c.
D. C. Dodge, *Gen. Man*.............Denver, Col.
C. M. Hobbs, *Pur. Agt*...............Denver, Col.
N. W. Sample, *Supt. M. P. & M*....Denver, Col.
(1) Col. & N. M. Div.: R. E. Ricker, *G. S.* Denver, Col.
1st Div.: W. W. Borst, *Supt*.......S. Pueblo, Col.
2d Div.: Cole Lydon, *Supt*..........Alamosa, Col.
3d Div.: G. W. Cook, *Supt*.........Leadville, Col.
4th Div.: R. M. Ridgway, *Supt*.......Salida, Col.
(2) Utah Div.: W. H. Bancroft, *G. S.* S. Lake City, Utah.
Des Moines, Osceola & Southern R. R.
3 g. 100 m. 7 lo. 253 cars.
L. B. Harding, *Gen. Man*.......Des Moines, Ia.
Henry Stivers, *Supt*.................Osceola, Ia.
L. D. Berry, *M. M*....................Osceola, Ia.
Elias Tonet, *M. C. B*...............Osceola, Ia.
Des Moines & Ft. Dodge. 4-8½ g. 144 m. 13 lo. 350 c.
C. N. Gilmore, *Supt*...............Des Moines, Ia.
John McGrayel, *M. M*......Grand Junction, Ia.
E. A. Avery, *M. C. B*.........Grand Junction, Ia.
Det., Bay City & Alpena R. R. 3-2 g. 48 m. 5 lo. 227 c.
Milo Eastman, *Supt*.............East Tawas, Mich.
Det., Gr. H. & Mil. Ry. 4-8½ g. 189 m. 39 lo. 696 c.
W. J. Spicer, *Gen. Man*...........Detroit, Mich.
John S. Lorimer, *Storekeeper*....Detroit, Mich.
W. J. Morgan, *Supt*.................Detroit, Mich.
H. Roberts, *Mech. Supt*......Port Huron, Mich.
R. P. Baillie, *M. M*..............Ft. Gratiot, Mich.
Det., Lansing & No'n R. R. 4-8½ g. 222 m. 84 lo. 1027 c.
John B. Mulliken, *Gen. Man*......Detroit, Mich.
Allan Bourn, *Pur. Agt*..............Detroit, Mich.
Thos. M. Fish, *Gen. Supt*............Ionia, Mich.
G. C. Watrous, *M. M. & C. B*.......Ionia, Mich.
Det., Mack. & Marq. R.R. 4-8½ g. 152 m. 16 lo. 1,112 c.
D. McCool, *Gen. Supt. & P. A.* Marquette, Mich.
W. J. Tench, *Pur. Agt*..........Marquette, Mich.
John B. Wilson, *Mech. Supt*...Marquette, Mich.
Dorchester & Delaware R.R. (*See Penna. (4) Del. Div.*)
Dubuque & Dakota R. R. 4-8½ g. 64 m. 2 lo. 54 cars.
A. C. Goodrich, *Supt*...............Waverly, Ia.
W. S. Couch, *Pur. Agt*..............Dubuque, Ia.
Duck River Valley R. R. (*See Nash., Chat. & St. L.*)
Dunkirk, Allegheny Valley & Pittsburgh R. R.
4-8½ g. 91 m. 14 lo. 102 cars.
D. Thayer, *Gen. Supt*............Dunkirk, N. Y.
R. C. Moore, *Pur. Agt*...........New York, N. Y.
J. C. Haggett, *M. M. & C. B*.....Dunkirk, N. Y.

E

East Alabama Ry. 5 g. 22 m. 3 lo. 19 cars.
W. W. Barnes, *Supt*...............Opelika, Ala.
East Broad Top R. R. 3 g. 30 m. 7 lo. 260 cars.
A. W. Sims, *Supt*..................Orbisonia, Pa.
A. W. Greenwood, *M. M*...........Orbisonia, Pa.
East St Louis & Carondelet Ry. 4-9 g. 4 lo. 27 c.
Joseph Hill, *Gen. Supt*......East St. Louis, Ill.
East Tenn. & Western North Car. R. R.
3 g. 34 m. 2 lo. 70 cars.
Thomas E. Matson, *Supt*. Elizabethton, Tenn.
East Tennessee, Virginia & Georgia R. R.
5 g. 1,453 m. 173 lo. 3,670 cars.
Henry Fink, *V. P. & Gen. Man*. Knoxville, Tenn.
J. F. O'Brien, *Gen. Supt*.......Knoxville, Tenn.
J. E. Wilcox, *Pur. Agt*.........Knoxville, Tenn.
East Tenn. Div. and No. Car. and Ohio Branches:
F. K. Huger, *Supt*............Knoxville, Tenn.
B. J. Sitton, *M. M*............Knoxville, Tenn.
Jos. Armbruster, *M. C. B*....Knoxville, Tenn.
Alabama Div.: J. M. Bridges, *Supt*...Selma, Ala.
Simon Gay, *M. M*......................Selma, Ala.
W. W. Pierce, *M. C. B*...............Selma, Ala.
Memphis & Charleston R. R. (Div.):
R. B. Pegram, Jr., *Supt*.....Memphis, Tenn.
H. N. Burford, *M. M*..........Memphis, Tenn.
Atlanta Div.: J. W. Fry, *Supt*......Atlanta, Ga.
W. A. Walden, *M. M*..................Atlanta, Ga.
J. H. Perkins, *M. C. B*...............Atlanta, Ga.
Brunswick Div.: J. E. Mallory, *Supt*..Macon, Ga.
East & West R. R. of Ala. 3 g. 110 m. 9 lo. 85 c.
John Postell, *Manager*.........Cedartown, Ga.
M. M. & C. B.....Cedartown, Ga.
Eastern R. R. 4-8½ g. 283 m. 110 lo. 2,268 cars.
Payson Tucker, *Gen. Man*.........Boston, Mass.
D. W. Sanborn, *Mast. of Trans*..Boston, Mass.
G. F. Hurd, *Pur. Agt*................Boston, Mass.
Amos Pilsbury, *S. M. P. & M*...E. Boston, Mass.
A. M. Waitt, *G. For. Car Dept*.....Salem, Mass.
Con'y Div.: J. W. Sanborn, *Supt*..Wolfboro J., N. H.
Eastern Kentucky R. R. 4-8½ g. 34 m. 5 lo. 160 c.
H. W. Bates, *Man. & Pur. Agt*....Riverton, Ky.
H. W. Crawford, *M. M*.........Hunnewell, Ky.
Eastern (Maine) R. R. (*See Maine Central.*)
Eastern Shore R. R. 4-8½ g. 38 m. 3 lo. 9 c.
W. Thompson, *Supt*.........Princess Anne, Md.
F. Strattner, *M. M*.........Princess Anne, Md.
Elberton Air-Line R.R. (*See Rich. & Dan. N. G. Brs.*)
Elizabeth City & Norfolk R. R. (*See Norfolk So.*)
Elizabethtown, Lex. & Big Sandy R.R. (*See Ches. & O.*)
Emmitsburg R. R. (*See Western Md.*)
Erie & Pittsburg R. R. (*See Penna. Co.; (3) Div.*)
Eureka Springs Ry. 4-8½ g. 19 m. 1 lo. 9 cars.
Powell Clayton, *Gen. Man*. Eureka Springs, Ark.
Eureka & Palisade R. R. 3 g. 97 m. 7 lo. 125 cars.
B. Gilman, *Gen. Supt & Pur. Agt*. Eureka, Nev.
J. M. Crawford, *M. M*.............Palisade, Nev.
A. S. Longley, *M. C. B*...........Palisade, Nev.
European & North American R. R. (*See Maine Cen.*)
Evansville, Rockport & E'n Ry. 4-9 g. 71 m. 5 lo. 98 c.
H. L. Shepard, *Supt*..............Evansville, Ind.
Evansv. & Terre Haute. 4-8½ g. 169 m. 26 lo. 973 c.
D. J. Mackey, *Gen. Supt*........Evansville, Ind.
John Torrance, *M. M*...........Evansville, Ind.

F

Fitchburg R. R., 4-8½ g. 152 m. 100 lo. 3,430 cars.
John Adams, *Gen. Supt*............Boston, Mass.
F. S. Pratt, *Pur. Agt*................Boston, Mass.
Orlando Stewart, *Supt. M. P*......Boston, Mass.
W. A. Foster, *Asst. Supt. M. P*..Fitchburg, Mass.
J. W. Marden, *M. C. B*.......Charlestown, Mass.
Flint & Pere Marq. 4-8½ g. 346 m. 72 lo. 2,100 cars.
H. C. Potter, *Gen. Man*.........E. Saginaw, Mich.
D. Edwards, *Asst. Gen. Man*..E. Saginaw, Mich.
G. G. Cook, *Pur. Agt*.........E. Saginaw, Mich.
Sanford Keeler, *Gen. Supt*..E. Saginaw, Mich.
W. F. Potter, *Supt*. (E. Div.)..E. Saginaw, Mich.
M. V. Meredith, *Supt*. (W. Div.) E. Saginaw, Mich.
T. J. Hatswell, *M. M*.........E. Saginaw, Mich.
R. McPherson, *M. C. B*........E. Saginaw, Mich.
Florida Ry. & Nav. Co. 5 g. 488 m. 31 lo. 397 c.
D. E. Maxwell, *Gen. Supt*.....Fernandina, Fla.
R. V. Dohoney, *M. M. & C. B*. Fernandina, Fla.
Florida Southern Ry. 3 g. 91 m. 6 lo. 96 cars.
Sherman Conant, *Gen. Man*.......Palatka, Fla.
Jas. D. Hollister, *Supt*.............Palatka, Fla.
Fonda, Johnst'n & Gloversv. 4-8½ g. 26 m. 5 lo. 35 c.
Lawton Caten, *Supt*..........Gloversville, N. Y.
G. V. Putman, *M. M*..........Gloversville, N. Y.
Fond du Lac, Amboy & Peoria. 3 g. 30 m. 2 lo. 35 c.
Alonzo Kinyon, *Supt. & P. A.* Fond du Lac, Wis.
Fort Dodge & Fort Ridley R. R. (*See Minn. & St. L.*)
Franklin & Prov. & Hopkinton. 22 m.
E. T. Logee, *Supt*...............Milford, Mass.
Ft. Madison & No.-West'n Ry. 3 g. 45 m. 5 lo. 127 c.
S. B. Kenrick, *Supt. & Pur. Agt*. Ft. Madison, Ia.
I. L. Lamb, *M. M. & C. B*........Ft. Madison, Ia.
Ft. Wayne, Cin. & Louisv. 4-8½ g. 128 m. 10 lo. 259 c.
White Water R. R. 4-8½ g. 65 m. 5 lo. 170 cars.
W. W. Worthington, *Gen. Supt*...Ft. Wayne, Ind.
T. H. Haberkorn, *M. M*.........Ft. Wayne, Ind.
Wm. Knight, *M. C. B*............Ft. Wayne, Ind.
Ft. Worth & Denver City Ry. 4-8½ g. 114 m. 8 lo. 443 c.
C. L. Frost, *Gen. Supt*.........Fort Worth, Tex.
Freehold & New York Ry. 4-8½ g. 15 m. 4 lo. 40 c.
J. E. Ralph, *Supt. & Pur. Agt*..Keyport, N. J.
M. C. Mooney, *M. M*...............Freehold, N. J.
C. H. Snedeker, *M. C. B*..........Freehold, N. J.
Fulton County N. G. Ry. 3 g. 61 m. 4 lo. 168 cars.
A. C. Atherton, *Gen. Supt. & P. Agt*. Lewiston, Ill.

G

Gainesville & Dahlonega R. R. 3 g. 15 m.
W. P. Price, *Pres*................Dahlonega, Ga.
Gainesville, Jefferson & Southern R.R. (*See Cen. of Ga.*)
Gal., Harrisburg & San Antonio Ry. (*See Cen. Pac.*)
Galveston, Houston & Hend. R.R. (*See Mo. Pac. (5) Div.*)
Galveston, Sabine & St. Louis Ry.
4-8½ g. 15 m. 2 lo. 27 cars.
Brad. Barner, *Gen. Man*.........Longview, Tex.
Chas. H. Jewell, *Gen. Supt*.....Longview, Tex.
Geneva, Ithaca & Sayre R. R. (*See Lehigh Val.*)
George's Creek & Cumberland R. R.
4-9 g. 25 m. 6 lo. 212 cars.
J. A. Millholland, *Gen. Man*..Cumberland, Md.
Georgetown & Lane's R. R. 5 g. 36 m. 2 lo. 52 c.
G. W. Earle, *Gen. Supt*......Georgetown, S. C.
Georgia R. R. 5 g. 307 m. 42 lo. 1,017 cars.
John W. Green, *Gen. Man*..........Augusta, Ga.
John S. Cook, *M. M*...................Augusta, Ga.
T. M. Preval, *M. C. B*...............Augusta, Ga.
Georgia Pacific Ry. 5 g. 218 m.
I. Y. Sage, *Gen. Supt*.........Birmingham, Ala.
S. H. Purcell, *Div. Supt*.......Greenville, Miss.
G. H. Barnum, *Div. Supt*.......Columbus, Miss.
J. A. Branigan, *M. M*...........Greenville, Miss.
J. B. Shelton, *M. C. B*..........Greenville, Miss.
Grand Haven R. R. (*See Chic. & W. Mich.*)
Grand Junction Ry. (*See Midland of Can.*)
Grand Rapids, Indiana & Mackinaw. (*See Gr. R. & I.*)
G'd Rap., Newaygo & L. S. R. R. (*See Chic. & W. M.*)
Grand Rapids & Indiana. 4-8½ g. 528 m. 52 lo. 1,724 c.
W. O. Hughart, *Gen. Man*. Grand Rapids, Mich.
W. R. Shelby, *Pur. Agt*....Grand Rapids, Mich.
S. D. Bradley, *M. M*.......Grand Rapids, Mich.
No'n Div.: J. M. Metheany, *Supt*. G'nd Rap., Mich.
So'n Div.: P. S. O'Rourke, *Supt*. Fort Wayne, Ind.
Grand Southern Ry. of New Brunswick.
4-8½ g. 82 m. 5 lo. 54 cars.
J. N. Greene, *Gen. Man*.........St. George, N. B.
F. W. Holt, *Supt*.................St. George, N. B.
Thomas Logan, *M. M*..........St. George, N. B.
Grand Tower & Carbondale. 4-8½ g. 25 m. 6 lo. 357 c.
T. M. Williamson, *Supt. & P. A*..Gr. Tower, Ill.
Hugh Smith, *M. M. & C. B*....Grand Tower, Ill.
Grand Trunk Ry. 4-8½ g. 2,332 m. 660 lo. 16,330 c.
Joseph Hickson, *Gen. Man*......Montreal, Can.
Jas. Stephenson, *Supt*...........Montreal, Can.
Wm. Wainright, *Asst. Man*.......Montreal, Can.
Mont. Divs.: W. J. Spicer, *Supt*..Montreal, Can.
Jno. Taylor, *Gen. Storekeeper*. Montreal, Can.
Herbert Wallis, *Mech. Supt*...Montreal, Can.
Wm. McWood, *Supt. Car Dept*. Montreal, Can.
J. Haskoni, *Div. M. S*.......Richmond, P. Q.
Gt. West'n Div.: Chas. Stiff, *Supt*. Hamilton, Ont.
E. Baines, *Store Kpr*...............London, Ont.
C. K. Domville, *Mech. Supt*...Hamilton, Ont.
C. F. Hanson, *Lo. For*...............London, Ont.
J. D. McIlwain, *Supt. Car Dept*..London, Ont.
Chi. & Gr. Trunk Ry. 4-8½ g. 339 m. 103 lo. 1,191 c.
W. J. Spicer, *Gen. Man*...........Chicago, Ill.
W. H. Pettibone, *Supt*...Battle Creek, Mich.
A. Judd, *Pur. Agt*...........Fort Gratiot, Mich.
H. Roberts, *Mech. Supt*.........Detroit, Mich.
Midland of Can. 4-8½ g. 471 m. 44 lo. 1,423 c.
W. B. Ferguson, *Supt*.........Peterboro, Ont.
J. D. Barnet, *Mech. Supt*......Peterboro, Ont.
Grand Trunk, Georgian Bay & Lake Erie Ry. (*See G. T.*)
Great Western Ry. (*See Grand Trunk; G. W. Div.*)
Green Bay, Winona & St. Paul R. R.
4-8½ g. 250 m. 19 lo. 623 cars.
Timothy Case, *Gen. Man. & P. A.* Green Bay, Wis.
A. Fenwick, *M. M*................Ft. Howard, Wis.
Green Cove Spring & Melrose R.R. 3 g. 32 m. 1 lo. 11 c.
S. Ackley, *Pres*.................Philadelphia, Pa.
Greenwich & Johnsonville Ry. 4-8½ g. 15 m. 1 lo. 7 c.
J. H. Thompson, *Supt*.........Greenwich, N. Y.
Gulf, Col. & Santa Fé Ry. 4-8½ g. 536 m. 51 lo. 1,400 c.
Webster Snyder, *Gen. Man*..Galveston, Texas.
Jno. W. Thorne, *Pur. Agt*....Galveston, Texas.
W. H. Reilly, *M. M. & M. C. B*..Galveston, Texas.
Gulf, W'n Texas & Pac. Ry. 4-8½ g. 68 m. 6 lo. 74 c.
M. D. Mouserrate, *Supt. & Pur. Agt*. Cuero, Tex.
James Mooney, *M. M*..................Cuero, Texas.

H

Hannibal & St. Jo. R. R. 4-8½ g. 292 m. 76 lo. 1,906 c.
J. F. Barnard, *Gen. Man*..............Chicago, Ill.
S. E. Crance, *Gen. Supt*............Hannibal, Mo.
Wm. Irving, *Pur. Agt*................Hannibal, Mo.
Jas. Long, *Supt. M. P. & Car Dep*. Hannibal, Mo.
Chas. Coller, *For. Car Dept*.......Hannibal, Mo.
Hanover Branch R. R. 4-8½ g. 8 m. 2 lo. 18 cars.
E. Y. Perry, *Supt*...........South Hanover, Mass.
Hanover Junction, Hanover & Gettysburg R. R.
4-8½ g. 74 m. 10 lo. 140 cars.
H. D. Scott, *Gen. Supt*.............Gettysburg, Pa.
John J. Bingley, *M. M*..............Hanover, Pa.
Jas. Harthorn, *M. C. B*............Hanover, Pa.
Harrisburg & Potomac R. R. 4-8½ g. 35 m. 3 lo. 35 c.
R. H. Middleton, *Supt*......Boiling Springs, Pa.
Hartford & Conn. Val. R. R. 4-8½ g. 47 m. 9 lo. 196 c.
O. M. Shepard, *Asst. Supt*.......New Haven, Ct.
John Henry, Jr., *M. M*..........Hartford, Conn.
Hartford & Conn. W'n R.R. 4-8½ g. 110 m. 16 lo. 495 c.
John F. Jones, *Supt*...................Hartford, Ct.
J. C. Barton, *M. M*....................Hartford, Ct.
Hartwell R. R. (*See Rich. & Dan.; N. G. Brs.*)
Hecla & Torch Lake R. R. 4-1 g. 5 m. 5 lo. 165 cars.
W. A. Childs, *Gen. Man*...........Calumet, Mich.
Herkimer, Newport & Poland Ry.
3-6 g. 17 m. 2 lo. 24 cars.
Albert Wilber, *Supt*...............Herkimer, N. Y.
Hobart & Manistee River R. R. 3 g. 9 m. 2 lo. 42 c.
H. W. Marsh, *Supt*.....................Hobart, Mich.
Hot Springs R. R. 3 g. 25 m. 3 lo. 37 cars.
J. N. Conger, *Supt*..............Hot Springs, Ark.
L. Finlay, *M. M*....................Malvern, Ark.
Housatonic R. R. 4-8½ g. 126 m. 25 lo. 571 cars.
W. H. Yeomans, *Supt*.............Bridgeport, Ct.
D. S. Draper, *Pur. Agt*............Bridgeport, Ct.
N. Slingland, *M. M*...............Falls Village, Ct.
J. J. Ferris, *M. C. B*..............Falls Village, Ct.
Houston Belt Ry. 4-8½ and 3 gauge 16 miles.
S. L. Werden, *V. P. & Gen. Man*. Houston, Tex.
Houston, East & West Tex. Ry. 3 g. 150 m. 10 lo. 570 c.
Paul Bremond, *Pr. & Pur. Agt*..Houston, Tex.
E. L. Bremond, *Gen. Man*.........Houston, Tex.
B. O. Diffey, *M. M*.....................Houston, Tex.
C. F. Schelewa, *M. C. B*..........Houston, Texas.
Houston & Tex. Cen. Ry. 4-8½ g. 750 m. 78 lo. 2,526 c.
J. Waldo, *V. Pr. & Gen. Man*....Houston, Tex.
A. H. Swanson, *Gen. Tr. Man*.....Houston, Tex.
Pur. Agt.........New York, N. Y.
L. C. Noble, *Gen. M. M*............Houston, Tex.
James McGee, *M. C. B*...............Houston, Tex.
So. & Wn. Divs.: M. G. Howe, *Supt*. Houston, Tex.
No. & Mi. Divs.: G. A. Quinlan, *Supt*., and
C. H. Burns, *Asst. M. M*......Corsicana, Tex.
No.-Wn. Div.: Donald Allen, *Supt*.....Waco, Tex.
Humeston & Shenandoah R. R.
4-8½ g. 113 m. 18 lo. 80 cars.
F. O. Wyatt, *Gen. Man*.............Clarinda, Ia.
C. H. Warren, *Supt*..................Clarinda, Ia.
W. B. Snyder, *M. M*..............Shenandoah, Ia.
Huntingdon & Br. Top Mt. 4-8½ g. 62 m. 18 lo. 69 c.
Geo. F. Gage, *Gen. Man*.........Huntingdon, Pa.
Samuel B. Knight, *Pur. Agt*..Philadelphia, Pa.
William Barkla, *M. M*....................Saxton, Pa.

I

Illinois Central R. R. 4-8½ g. 1,928 m. 334 lo. 8,565 c.
E. T. Jeffery, *Gen. Supt*.................Chicago, Ill.
O. Ott, *Pur. Agt*..........................Chicago, Ill.
Henry Schlacks, *Supt. of Mach*....Chicago, Ill.
W. B. Snow, *M. M. Car Works*.....Chicago, Ill.
(1) Ill. & Ia. Divs.: C. A. Beck, *Supt*.....Chicago, Ill.
Chic. Div.: T. J. Hudson, *Supt*...........Cairo, Ill.
Wm. Renshaw, *M. M*..................Chicago, Ill.
Mid. Div.: H. L. Frisbie, *Supt*..........Pontiac, Ill.
Spring. Div.: W. Wilkinson, *Supt*. Springfield, Ill.
W. B. McKenna, *M. M*..................Clinton, Ill.
No'n Div.: J. C. Jacobs, *Supt*..............Amboy, Ill.
J. B. Edams, *M. M*.......................Amboy, Ill.
Ia. Div.: M. Gilleas, *Supt*...............Dubuque, Ia.
Thos. W. Place, *M. M*..................Waterloo, Ia.
(2) So. Divs.: C. M. Sheafe, *Supt*....New Orleans, La.
Geo. W. Baxter, *M. C. B*..McComb City, Miss.
So. Div.: J. M. Turner, *Supt*. do.
E. D. Anderson, *M. M*.....McComb City, Miss.
Miss. Div.: J. G. Mann, *Supt*......Jackson, Tenn.
J. F. White, *M. M*.........Water Valley, Miss.
Illinois Midland Ry. 4-8½ g. 176 m. 12 lo. 611 cars.
D. H. Conklin, *Rec. & Gen. Man*......Decatur, Ill.
O. E. Grady, *Train Mast*...............Decatur, Ill.
Frank Young, *For. Shops*...................Paris, Ill.
Illinois & St. Louis R. R. 4-8½ g. 19 m. 10 lo. 450 c.
C. H. Sharman, *Gen. Supt. & P. A.* St. Louis, Mo.
D. J. Timlin, *M. M*.......................Belleville, Ill.
Charles Rothe, *M. C. B*................E. St. Louis, Ill.
Indiana, Bloomington & Western Ry.
4-8¾ g. 826 m. 112 lo. 4,067 cars.
C. E. Henderson, *Gen. Man*. Indianapolis, Ind.
I. H. Wilson, *Gen. Supt*.....Indianapolis, Ind.
H. C. Norton, *Pur. Agt*.......Indianapolis, Ind.
Jos. S. Porter, *M. M*....................Sandusky, O.
B. Warren, *Gen. M. M*.........Indianapolis, Ind.
Peoria Div.: E. Hiserodt, *M. M*.......Urbana, Ill.
St. Louis Div.: John King, *M. M*. Indianapolis, Ind.
Ohio So. Rd.: W. H. Van Tassall, *S*. Springfield, O.
A. J. Sanborn, *M. M*..................Springfield, O.
Indiana, Illinois & Iowa R.R. 4-8½ g. 104 m. 5 lo. 83 c.
F. M. Drake, *Gen. Man*..............Kankakee, Ill.
T. P. Shonts, *Gen. Supt*.............Kankakee, Ill.
R. C. Ackley, *M. M*....................Kankakee, Ill.
Indiana & Illinois Southern Ry. 3 g. 91 m. 3 lo. 69 c.
W. C. Lyon, *Gen. Man. & P. Agt*. Robinson, Ill.
J. S. Pickering, *M. M. & C. B*.....Effingham, Ill.
Indianapolis, Decatur & Springfield Ry.
(*See Ind., Bloom. & West'n.*)
Indianapolis & St. Louis R. R. (*See C., C., C. & I.*)
Indianapo. & Vincennes R. R. (*See Penna. Co.; (8) Div.*)
Intercolonial Ry. 4-8½ g. 846 m. 135 lo. 4,500 cars.
David Pottinger, *Chief Supt*.....Moncton, N. B.
T. V. Cook, *Gen. Storekeeper*....Moncton, N. B.
H. A. Whitney, *Mech. Supt*.......Moncton, N. B.
Ewd. D. Shaffer, *M. C. B*..........Moncton, N. B.
M. & C. Div.: J. E. Price, *Supt*..Cambellton, N. B.
Hal. & St. J. Div.: J. J. Wallace, *Supt*..Truro, N. S.
Q. & St. F. Div.: A. McDonald, *Supt*. Riv. du Loup, Q.
International Ry. 4-8½ g. 69 m. 7 lo. 12 cars.
D. E. McFee, *Supt*...............Sherbrooke, Que.
J. Ruelle, *M. M*.....................Sherbrooke, Que.
W. Charest, *M. C. B*.................Sherbrooke, Que.
International & Gt. N'n R. R. (*See Mo. Pac.; (5) Div.*)
Iowa Falls & Sioux City R. R. (*See Ill. Cen.*)
Iron Ry. (*See Tol., Cin. & St. L.*)
Iron Mountain & Helena R. R. (*See Mo. Pac.; (4) Div.*)
Ithaca Auburn & Western Ry. (*See Southern Cen.*)

J

Jacksonville So.-E'n R. R. 4-8½ g. 54 m. 5 lo. 69 c.
E. S. Greenleaf, *Supt*...........Jacksonville, Ill.
Ira F. Petrie, *M. M*.................Jacksonville, Ill.
Jacksonville, St. Augustine & Halifax River Ry.
3 g. 76 m. 3 lo. 27 cars.
W. L. Crawford, *Gen. Man*..Jacksonville, Fla.
H. S. Ming, *Supt*.....................Jacksonville, Fla.
Jacksonv., Pensacola & Mob. (*See Fla. Cent. & W.*)
Jamesville & Washington R. R. (*See Norfolk So'n.*)
Jeffersonv'l, Madison & Indpls. R. R. (*See (9) Pa. Co.*)
Jersey City & Albany R. R. 4-8½ g. 38 m.
J. W. McCulloh, *Manager*....Jersey City, N. J.
Jersey City & Bergen R. R. 4-8½ g. 6 m. 2 lo. 13 c.
T. M. Sayre, *Gen. Supt*..........Jersey City, N. J.
Jersey Shore, Pine Creek & Buff. Ry. (*See Phil. & R.*)
Junction & Breakwater R.R. (*See Del., Md. & Va.*)

K

Kaaterskill R. R. 3 g. 8 m.
J. H. Jones, *Supt*...................Rondout, N. Y.
Kankakee & Seneca R.R. (*See Cin., Ind., St. L. & Chi.*)
Kansas Central R. R. (*See Union Pacific.*)
Kansas City, Fort Scott & Gulf R. R.
4-8½ g. 389 m. 75 l. 2,037 c.
Geo. H. Nettleton, *Gen. Man*..Kansas City, Mo.
L. W. Towne, *Supt*...............Kansas City, Mo.
H. P. Jacques, *Pur. Agt*........Kansas City, Mo.
J. S. McCrum, *M. M*..............Kansas City, Mo.
A. N. Montier, *M. C. B*.........Kansas City, Mo.
Kansas Cy, Lawrence & So. Kan. (*See At., Top. & S. F.*)
Kansas City, Springfield & Memphis R. R.
4-8½ g. 283 m. 10 lo. 456 cars.
George H. Nettleton, *Pres*.....Kansas City, Mo.
L. W. Towne, *Supt*...............Kansas City, Mo.
H. P. Jacques, *Pur. Agt*........Kansas City, Mo.
J. S. McCrum, *M. M*..............Kansas City, Mo.
A. H. Montier, *M. C. B*.........Kansas City, Mo.
Kansas City, St. Joseph & Council Bluffs; and St. Jo. & Des Moines R. Rs. 4-8½ & 3 g. 368 m. 41 lo. 1,148 c.
J. F. Barnard, *Gen. Supt*.........St. Joseph, Mo.
J. R. Hardy, *Supt*....................St. Joseph, Mo.
Wm. Irving, *Pur. Agt*.................Chicago, Ill.
F. A. Chase, *M. M*......................St. Joseph, Mo.
Thos. Aylesbury, *G. For. Car. Dep*. St. Joseph, Mo.
Kansas City & Southern Ry. 4-8½ g. In progress.
Wm. Bailey, *Pres*..................Kansas City, Mo.
Kansas Coal Belt R. R. 4-8½ g. In progress.
C. H. Malin, *Gen. Man*..............Girard, Kan.
F. A. Hill, *Supt*.........................Girard, Kan.
Kansas & Gulf Short Line R. R. 33 m. 2 lo. 32 cars.
Eli Culverhouse, *Gen. Man*..............Tyler, Tex.
V. K. Stevenson, *Pur. Agt*.....New York, N. Y.
Kendall & Eldred R. R. (*See Buf., N. Y. & Phil.*)
Kent Northern Ry. 4-8½ g. 27 m. 2 lo. 16 cars.
J. C. Brown, *Gen. Man*........Richibucto, N. B.
Kentucky Central R. R. 4-9 g. 184 m. 22 lo. 640 cars.
G. W. Bender, *Supt*.................Covington, Ky.
A. H. Watts, *M. of Mach*..........Covington, Ky.
M. C. B.........Covington, Ky.
Kentucky & South Atlantic Ry. 3 g. 23 m. 3 lo. 52 c.
Geo. B. Harper, *Supt. & P. A*..Mt. Sterling, Ky.
S. P. Hatfield, *M. M*................Mt. Sterling, Ky.
Keokuk & Des Moines R.R. (*See Chi., R. I. & Pac.*)
Kinzua R. R. (*See Buf., N. Y. & Phil.*)
Kingston & Pembroke Ry. 4-8½ g. 90 m. 9 lo. 214 c.
B. W. Folger, *Supt*...................Kingston, Ont.
J. H. Taylor, *Pur. Agt*...............Kingston, Ont.
J. H. Taylor, *M. M*.....................Kingston, Ont.
Knox & Lincoln R. R. 4-8½ g. 49 m. 5 lo. 103 cars.
C. A. Coombs, *Supt*.........................Bath, Me.
Wm. A. Field, *M. M*.........................Bath, Me.
C. L. Turner, *M. C. B*.......................Bath, Me.
Knoxville & Augusta R. R. 5 g. 16 m. 2 lo. 34 cars.
R. N. Hood, *Gen. Man. & P. Agt*. Knoxville, Tenn.
J. M. Hood, *Supt*......................Knoxville, Tenn.

L

Lackawanna & Pittsburgh R. R. 3 g. 97 m.
R. M. Patterson, *Gen. Supt*.....Angelica, N. Y.
Lake Champlain & Moriah R.R. 4-8½ g. 8 m. 8 lo. 222 c.
E. B. Hedding, *Supt*..................Port Henry, N. Y.
Lake Erie & Western Ry. 4-8½ g. 388 m. 53 lo. 1,701 c.
J. H. Cheney, *Gen. Man*.........Bloomington, Ill.
D. S. Hill, *Gen. Supt*..............Bloomington, Ill.
T. H. Perry, *Pur. Agt*.............Bloomington, Ill.
H. L. Cooper, *Supt. of Equipment*....Lima, O.
Lake George & Muskegon River R. R.
4-8½ g. 20 m. 4 lo. 79 cars.

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MACHINES
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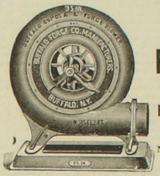

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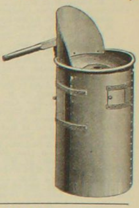

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A PERFECT MACHINE FOR THE INTERNAL LUBRICATION OF THE
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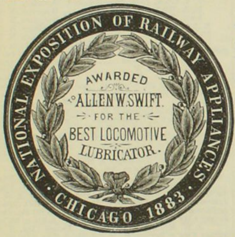
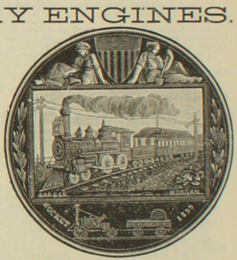


This device delivers any desired quantity to each cylinder POSITIVELY, and its feed-rate remains unchanged with the Engine at FULL STROKE, THROTTLED or REVERSED.

Will feed any ordinary Lubricant from the lightest oils to the
HARDEST TALLOW
IN THE COLDEST WEATHER.

Positive Feed Flash "Sight."
NO EXTERNAL OR INTERNAL PIPES,
NO GLASS TUBES OR LOOSE JOINTS.
Approved by the Eastern and Western R. R. Association.



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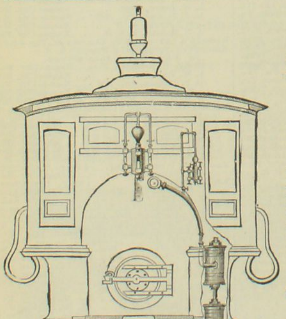
CORRESPONDENCE SOLICITED.
"SWIFT" LUBRICATOR COMPANY, ELMIRA, N. Y.



THE DETROIT LUBRICATOR COMPANY'S
SIGHT FEED LUBRICATORS,
For Locomotive Cylinders and Air-Pumps.

The attention of railroad men is invited to the Detroit Lubricator Co.'s Patent Sight Feed Lubricators, for oiling locomotive valves and cylinders, and the Westinghouse Air Pump. Both cups are placed within the cab. The valve cup has a double sight feed, each of which is connected to the right and left hand steam chests, by means of the so-called "tallow pipes," running beneath the jacket, thus securing *independent lubrication to each steam chest and cylinder from the one cup.* The oil is shown passing in drops through each sight feed glass to the parts to be lubricated, and can be regulated to feed fast or slow. *The feed is regular and continuous, going up or down grade, whether pressure is on or off,* thus securing perfect lubrication at all times. What is said in reference to the valve cup, is equally true in regard to our lubricator for the Westinghouse Pump. By the use of these cups, the saving in wear and tear of machinery and the additional power gained is simply wonderful, as is proved by actual results.*

We solicit a practical test, and will send one or more valve and air-brake cups to responsible parties on 30 days' trial. Details and drawings showing manner of attachment and prices furnished on application.

DETROIT LUBRICATOR CO.
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* Numerous examples can be furnished where engines have run *two years and over, without having had their valves faced.* The average mileage for the air-brake lubricator is 500 to 1,500 miles to the ½ pint, and example can be given where this mileage has been greatly exceeded, among which is one of 1,612 *miles with a ½ pint* of oil on a daily run of 208 miles with 64 stops. This pump has run *nine months without having had 25 cents expended on it for repairs.*

HALE & KILBURN MANUFACTURING COMP'Y,
48 AND 50 NORTH SIXTH STREET, PHILADELPHIA, PA.,

ELASTIC SLAT SEAT.

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RATTAN SPRING SEAT.

EXTENSIVE MAKERS
OF
PATENTED CAR SEATS
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SPRINGS.

SPRING EDGE SEAT.

ESTIMATES,
CIRCULARS
AND
SAMPLES FURNISHED
ON
APPLICATION.

PARLOR CAR CHAIR.

W. S. Gerrish, *Gen. Man*....Muskegon, Mich.
Lake Shore & Michigan So'n Ry.
4-8½ g. 1,340 m. 547 lo. 17,115 cars.
John Newell, *Gen. Man*....Cleveland, O.
P. P. Wright, *Gen. Supt*....Cleveland, O
L. G. Higgins, *Pur. Agt*....Cleveland, O.
G. W. Stevens, *Supt. M. P*....Cleveland, O.
John Kirby, *Gen. M. C. B*....Cleveland, O.
East'n Div.: C. B. Couch, *Supt*....Cleveland, O.
J. S. Graham, *M. M*....Buffalo, N. Y.
A. C. Robson, *M. C. B*....Buffalo, N. Y.
L. O. Gassett, *M. M*....Cleveland, O.
J. Withycombe, *M. C. B*....Cleveland, O.
Frank. Div.: G. H. McIntire, *Supt.* Youngstown, O.
Toledo Div.: Thos. Flesher, Jr., *Supt.* Cleveland, O.
J. M. Sanborn, *M. M*....Norwalk, O.
W. O. Smith, *M. C. B*....Norwalk, O.
Mich. Divs.: J. E. Curtis, *Supt*....Toledo, O.
Det. Brs.: T. J. Charlesworth, *Supt.* Detroit, Mich.
Lansing, Ypsilanti & Ft. Wayne Branches.
W. H. Caniff, *Supt*....Hillsdale, Mich.
Western Div.: A. G. Amsden, *Supt*...Chicago, Ill.
W. L. Gilmore, *M. M*....Elkhart, Ind.
Frank O. Bray, *M. C. B*....Adrian, Mich.
Gr. Rap. Br.: M. E. Wattles, *Supt.* Kalamazoo, Mich.
Lake Tahoe R. R. 3 g. 10 m. 3 lo. 49 cars.
D. L. Bliss, *Gen. Man*....Carson, Nev.
John T. Rogers, *Gen. Supt*....Carson, Nev.
Geo. R. Lindsay, *M. M*....Carson, Nev.
Leavenworth, Topeka & So. W'n Ry. (*See A. T. & S. F.*)
Lebanon Springs R. R. 4-8½ g. 58 m. 5 lo. 44 c.
W. C. Alstyne, *Gen. Man*....Albany, N. Y.
W. H. Hawkins, *Pur. Agt*....Albany, N. Y.
Geo. Tefft, *M. M*....Chatham, N. Y.
Lehigh Valley R. R. 4-8½ g. 495 m. 392 lo. 36,998 c.
H. S. Goodwin, *Gen. Supt*....Bethlehem, Pa.
W. C. Alderson, *Pur. Agt*....Philadelphia, Pa.
John I. Kinsey, *M. M*....So. Easton, Pa.
John S. Lentz, *M. C. B*....Packerton, Pa.
N. J. Div.: Jas. Donnelly, *Supt.* Perth Amboy, N. J.
Coal Rds.: J. I. Blakeslee, *Supt.* Mauch Chunk, Pa.
D. Clark, *M. M*....Hazleton, Pa.
John Campbell, *M. M*....Delano, Pa.
B. M. Div.: A. G. Brodhead, *S.*..Mauch Chunk, Pa.
P. Hofecker, *M. M*....Weatherly, Pa.
Wy. Div.: A. Mitchell, *S. & M. M.* Wilkesbarre, Pa.
Pa. & N. Y.: and Geneva, Ithaca & Sayre R. Rs.
Wm. Stevenson, *Gen. Supt*....Sayre, Pa.
J. N. Weaver, *M. M*....Sayre, Pa.
Lehigh & Hudson River Ry. 4-8½ g. 63 m. 8 lo. 350 c.
Grinnell Burt, *Gen Man*....Warwick, N. Y
N. L. Furman, *Supt*....Warwick, N. Y.
John Sayre, *Pur. Agt*....Warwick, N. Y.
N. L. Furman, *Supt*....Warwick, N. Y.
S. Mills, *M. M*....Warwick, N. Y.
Lehigh & Lackawanna and Lehigh & Susquehanna R. Rs. (*See Phil. & Read.; N. J. Cen. Div.*)
Levis & Kennebec R. R. (*See Quebec Cen.*)
Ligonier Valley R. R. 4-9 g. 11 m. 2 lo. 22 cars.
Thos. A. Mellon, *Gen. Manager*... Pittsburg, Pa.
Geo. Senft, *Supt. & P. Agt*....Latrobe, Pa.
Little Miami R. R. (*See Penna. Co.'s Rds.; (8) Div.*)
Little Rock, Miss. River & Texas Ry.
4-8½ g. 170 m. 12 lo. 299 cars.
H. Wood, *Gen Man*....Little Rock, Ark.
F. A. Lister, *Gen. Supt*....Little Rock, Ark.
F. Hufsmith, *M. M. & C. B.*...Arkansas City, Ark.
Little Rock & Fort Smith. 4-8½ g. 170 m. 13 lo. 360 c
Hy. Wood, *Gen. Man*....Little Rock, Ark
F. A. Lister, *Gen. Supt*....Little Rock, Ark.
F. Hufsmith, *M. M. & M. C. B.*....Argenta, Ark
Little Saw Mill Run R. R. 3 & 4-8½ g. 8 m. 4 lo. 327 c.
T. Hartley, *Gen. Man*....Banksville, Pa.
Long Island R. R. 4-8½ g. 352 m. 92 lo. 953 cars.
I. D. Barton, *Gen. Supt.*..Long Island City, N. Y
Benj. Norton, *Pur. Agt.*..Long Island City, N. Y.
C. A. Thompson, *M. M.* Long Island City, N. Y.
Longview & Sabine Valley R. R. (*See Gal. Sab. & St. L.*)
Louisiana W'n R. R. (*See Cen. Pac.; G., H. & S. A. Div.*)
Louisville, Cin. & Lexington R. R. (*See Louis. & N.*)
Louis., Evans. & St. L. Ry. 4-8½ g. 254 m. 24 lo. 1,032 c
Geo. T. Evans, *Gen. Man*....Louisville, Ky.
C. F. Dalton, *Gen. Supt*....Louisville, Ky.
F. P. Boatman, *M. M*....Evansville, Ind.
Louisville, New Albany & Chicago Ry.
4-8½ g. 470 miles 56 lo. 3,700 cars.
John B. Carson, *Gen. Supt.*....Louisville, Ky.
T. L. Dunn, *Gen. Supt*....Chicago, Ill.
H. O. Nourse, *Pur. Agt*....Louisville, Ky.
Josiah Bettis, *M. M. & C. B.*...New Albany, Ind.
C. C. F. Bent, *Supt. Trans.*....Lafayette, Ind.
Louisville, New Orleans & Tex. Ry. 450 m. In progress.
R. T. Wilson, *Pres*....New York.
John Bradley, *Div. Supt*....New Orleans, La.
Louisville & Nashville R. R.
5 g. 2,186 m. 380 lo. 12,197 cars.
J. T. Harahan, *Gen. Man*....Louisville, Ky.
W. P. Harris, *Supt*....Louisville, Ky.
P. P. Huston, *Pur. Agt*....Louisville, Ky.
Reuben Wells, *Supt. Mach*....Louisville, Ky.
Louisv., Cin. & Lex. Divs.:
J. G. Metcalf, *Supt. Trans*....Louisville, Ky.
P. Leeds, *M. M*....Louisville, Ky.
J. W. Luttrell, *M. M*....Louisville, Ky.
J. G. Clifford, *M. M.* (2d & C. Div.). Bowling Grn. Ky.
Henderson Div.: J. Geddes, *Supt.* Henderson, Ky.
W. P. Pike, *M. M*....Nashville, Tenn.
Nash. & D. Div.: J. Geddes, *Supt.* Nashville, Tenn.
S. & N. A. Div.: *Supt*...Birmingham, Ala.
C. W. White, *M. M*....Birmingham, Ala.
Mob. & M.; N. Div. Pens. & Sel.; Sl. & Mont. R. Rs.:
M. S. Belknap, *Supt*....Montgomery, Ala.
J. N. Hall, *M. M.* (Mont. Shops). Montgomery, Ala.
N. O. Div.: O. M. Dunn, *Supt*....New Orleans, La.
Wm. Adair, *M. M*....Mobile, Ala.
Memp. Div.: W. Colcamp, *Supt.* Memphis, Tenn.
J. V. Slusser, *M. M*....Memphis, Tenn.
St. L. Div.: C. O. Parker, *Supt.* Montgomery, Ala.
Thos. Walsh, *M. M*....Mt. Vernon, Ill
Pensacola and So. Div. Pens. & Selma Rds.:
E. O. Saltmarsh, *Supt*....Pensacola, Fla.
W. D. Robb, *M. M*....Pensacola, Fla.
Louisville & Wadley R. R. 5 g. 10 m. 1 lo. 5 c.
J. H. Wilkins, *Supt. & Pur. Agt.* Louisville, Ga.

M

Macon & Brunswick R. R. (*See E. Tenn., Vir. & Ga.; At. & Ga. Divs.*)
Maine Central R. R. 4-8½ g. 465 m. 59 lo. 1,335 c.
Payson Tucker, *Gen. Man*....Portland, Me.
Ira K. Russell, *M. M*....Waterville, Me.
C. H. Kenison, *M. C. B*....Augusta, Me.
Eastern Maine. 3 g. 19 m. 2 lo. 40 c.
L. L. Lincoln, *Supt*....Portland, Me.
Manchester & Keene R. R. 4-8½ g. 30 m. (*See Concord.*)
Manchester & Lawrence R. R. (*See Concord.*)
Manchester & North Weare R. R. (*See Concord.*)
Manhattan Ry. 4-8½ g. 32 m. 228 lo. 652 pass. c.
Frank K. Hain, *Gen. Man*....New York, N. Y.
W. T. Goundie, *Supt. Trans.*..New York, N. Y.
T. W. Peeples, *M. M*....New York, N. Y.
H. A. Webster, *M. C. B*....New York, N. Y.
Manhattan, Alma & Burlingame Ry. (*See A., T. & S. F.*)
Manitoba Southwestern Colonization Ry.
4-8½ g. 52 m. 3 lo. 125 cars.
J. M. Eagan, *Gen. Supt*....Winnipeg, Man.
Chas. Newell, *M. M*....Winnipeg, Man.
Marietta & Cincinnati R. R. (*See Cin. Wash. & Balt.*)
Marietta & North Georgia R. R. 3 g. 60 m. 3 lo. 7 c.
J. B. Glover, *Supt. & P. Agt*....Marietta, Ga.
E. A. Withers, *M. M*....Marietta, Ga.
Marquette, Houghton & Ontonagon R. R.
4-8½ g. 100 m. 42 lo. 2,530 cars.
John Hornby, *Gen. Man*....Marquette, Mich.
M. B. McGee, *Pur. Agt*....Marquette, Mich.
W. A. Thompson, *M. M*....Marquette, Mich.
H. D. Lyons, *M. C. B*....Marquette, Mich.
Maryland Central R. R. 3 g. 27 m. 4 lo. 56 cars.
S. G. Boyd, *Supt*....Baltimore, Md.
Marquette & Western.
D. McCool, *Gen. Supt*....Marquette, Mich.
W. J. Tench, *Pur. Agt*....Marquette, Mich.
Massachusetts Central R. R. 4-8½ g. 48 m. 5 l. 81 c.
E. G. Allen, *Supt. & Pur. Agt*....Boston, Mass.
E. A. Walker, *M. M*....So. Sudbury, Mass.
McComb, Deshler & Toledo R. R. (*See Cin., Ham. & Day.; D. & M. Div.*)
Meadville Ry. (*See Penna. Co.'s Rds.; (2) Div.*)
Memphis & Charleston R. R. (*See E. Tenn. Va. & Ga.*.
Memphis & Lit. Rock R. R. 5 g. 135 m. 14 lo. 299 c.
R. Fink, *G. Man. & P. A.*....Little Rock, Ark.
H. G. Fleming, *Supt*....Memphis, Tenn.
Thos. Rennell, *M. M*....Argenta, Ark.
T. Rennell, *M. C. B*....Argenta, Ark.
Mexican Ry. 4-8½ g. 293 m. 42 lo. 616 cars.
E. W. Jackson, *Gen. Man*....Mexico, Mex.
Mexican Central Ry. 4-8½ g. 680 m. 73 lo. 818 c.
Theo. Nickerson, *Pur. Agt*....Boston, Mass.
D. B. Robinson, *Gen. Man*....City of Mexico.
D. MacKenzie, *Gen. Supt*....City of Mexico.
J. H. O'Brien, *M. M*....City of Mexico.
G. T. Jarvis, *Div. Supt*....City of Mexico.
J. H. Smith, *Div. Supt*....Silao, Mex.
Wm. Davis, *Div. Supt*....Jimulco, Mex.
E. E. Comfort, *Div. Supt.*..Paso del Norte, Mex.
F. W. Johnstone, *Supt. R. S.*...City of Mexico.
E. P. Simpson, *M. M*....City of Mexico
A. Hendee, *M. M*....Calera, Mex.
C. F. Stewart, *M. M*....Silao, Mex.
W. L. Wallace, *M. M*....Jimulco, Mex.
J. G. McCuen, *M. M*....Chihuahua, Mex.
San Blas Div.: C. E. Payne, *Supt.*..San Blas, Mex.
1st Div.: G. T. Jarvis, *Supt*....City of Mexico.
2d Div.: J. H. Smith, *Supt*....Silas, Mex.
3d Div.: Wm. Davis, *Supt*....Jimulco, Mex.
4th Div.: R. E. Comfort, *Supt.* Paso Del Norte, Mex.
Mexican National Ry. 3 g. 766 m. 50 lo. 1,283 c.
Texas Mexican Ry. 3 g. 171 m. 10 lo. 212 c.
R. C. Peebles, *Supt*....Mexico, Mex.
W. F. Baldwin, *Asst. Supt*....Laredo, Tex.
Galv. Div. T. M. Ry.: M. Quin, *Supt.* Galveston, Tex.
No. Div. Mex. Nat. Ry. & So. Div. Tex.-Mex. Ry.
C. A. Merriam, *Supt*....Laredo, Texas.
Tho. Milan, *M. M*....Corpus Christi, Tex.
So. Div. M. N. Ry.: W. E. Lewis, *Supt.* Mexico, Mex.
J. M. Winslow, *M. M*....Mexico, Mex.
Mat. Div.: F. E. Butterfield, *Supt.* Matamoras, Mex
Mexican, Oriental, Inter-Oceanic & International R. R. 1,400 miles. In progress.
G. M. Dodge, *Pres.* 195 B'way, New York, N. Y.
Michigan Cen. R. R. 4-8½ g. 1,485 m. 357 lo. 11,284 c.
H. B. Ledyard, *Pres. & Gen. Man.* Detroit, Mich.
E. C. Brown, *Gen. Supt*....Detroit, Mich.
Robert Miller, *Asst. Gen. Supt.*..Detroit, Mich.
Allan Bourn, *Pur. Agt*....Detroit, Mich.
S. H. Edgerly, *Gen. M. M*....Jackson, Mich.
(1) Lines West of Detroit River:
E. C. Brown, *Gen. Supt*....Detroit, Mich.
East. Div.: D. S. Sutherland, *Supt.* Detroit, Mich.
Bay City, Saginaw & Mackinaw Divisions.:
W. A. Vaughan, *Supt*....Bay City, Mich.
C. E. Smart, *M. M*....Bay City, Mich.
Main Line: Gr. Rap.; So. Bend; and So. Hav. Divs.:
C. B. Bush, *Supt*....Jackson, Mich.
W'n Divs.: R. H. L'Hommedieu, *Supt.* Chicago, Ill.
(2) Lines East of Detroit River:
Wm. H. Perry, *Agt*....Buffalo, N. Y.
J. E. Morford, *Supt.*....St. Thomas, Ont.
A. Bull, *M. M*....St. Thomas, Ont.
Rob't Potts, *M. C. B.*....St. Thomas, Ont.
Michigan & Ohio.
Luther Allen, *Supt*....Toledo, O.
H. H. Mitchell, *Pur. Agt*....Toledo, O.
D. J. Durrell, *M. M*....Marshall, Mich.
Middleburg & Schoharie: and Schoharie Valley R. Rs. 4-8½ g. 11 m. 2 lo. 6 cars.
P. S. Danforth, *Gen. Supt*...Middleburg, N. Y.
Midland of Canada. (*See Grand Trunk.*)
Midland No. Carolina Ry. 5 g. 95 m. 9 lo. 82 cars.
Atlantic & North Carolina Ry. 22 m.
John D. Whitford, *Gen. Man.*..Newbern, N. C.
J. A. Bryan, *Supt*....Newbern, N. C
D. J. Sprague, *Pur. Agt*....New York, N. Y.
S. Manly, *Supt. of Mach*....Newbern, N. C.
Milwaukee, Lake Shore & Western Ry.
4-8½ g. 370 m. 45 lo. 1,536 cars.
H. G. H. Reed, *Gen. Man. & P. Agt.* Milwaukee, Wis
J. Donahue, *Supt*....Milwaukee, Wis
David B. Curtis, *Asst. Supt*....Oshkosh, Wis
John Hickey, *M. M*....Ledyard, Wis.
Milwaukee & Northern and Wisconsin & Michigan R. Rds. 4-8½ g. 228 m. 24 l. 703 cars
C. F. Dutton, *Gen. Supt*....Milwaukee, Wis.
N. S. Kimball, *M. M*....Ft. Howard, Wis.
Mineral Range R. R. 3 g. 13 m. 4 lo. 43 cars
Chas. E. Holland, *Pr. & Supt.*..Hancock, Mich.
W. H. Carr, *Pur. Agt*....Hancock, Mich.
T. J. Shellhorn, *M. M. & C. B.*..Hancock, Mich.
Minneapolis, Lyndale & Minnetonka Ry.
3 g. 20 miles 4 motors 1 lo. 35 cars.
William McCrory, *Man*....Minneapolis, Minn.
T. W. Heintzelman, *M. M.*..Minneapolis, Minn.
Mississippi, Terre Aux Boeufs & Lake R. R.
29 miles.
M. R. Spelman, *Supt*....New Orleans, La.
Mississippi & Tenn. R. R. 4-8½ g. 101 m. 12 lo. 194 c.
M. Burke, *Gen. Supt*....Memphis, Tenn
J. C. Ramsey, *M. M*....Memphis, Tenn.
S. J. Bolton, *M. C. B*....Memphis, Tenn.
Missouri, Kansas & Texas Ry. (*See Mo. Pac.; (2) Div.*)
Missouri Pacific Ry. (Leased and operated lines.)
4-8½ g. 6,029 m. 697 lo. 19,748 cars.
H. M. Hoxie, *3d V. Pres*....St. Louis, Mo.
R. B. Lyle, *Pur. Agt*....St. Louis, Mo.
(1), (2) and (3) Divs.:
John Hewitt, *Supt. M. P. & M.*..St. Louis, Mo.
John Hodge, *Supt. Car Dep*....St. Louis, Mo.
Frank Howard, *Asst. Supt. C. D.*..Marshall, Tex.
(4), (5) and (6) Divs.:
O. A. Haynes, *S. M. P. & M.*....Marshall, Tex.
(1) Missouri Pacific Ry. 1,028 m. 155 lo. 4,218 cars.
A. M. Hagar, *Supt*....Sedalia, Mo.
E. Taylor, *M. M*....Sedalia, Mo.
W'n Div.: A. M. Hagar, *Supt*....Sedalia, Mo.
(2) Mo., Kan. & Tex. Ry. 1,308 m. 140 lo. 4,248 cars.
S. Irvin, *Asst. Supt. Car Dep*....Sedalia, Mo.
J. B. Vandyne, *Supt*....Parsons, Kan.
J. W. Haines, *M. M*....Parsons, Kan.
(3) Central Branch Un. Pac. R. R. 388 m. 30 lo. 599 c.
W. W. Fagan, *Supt*....Atchison, Kan.
H. V. Faries, *M. M*....Atchison, Kan.
J. W. Blackburn, *A. Supt. Car D.*..Atchison, Kan.
(4) St. L., I. Mt. & So'n Ry. 905 m. 138 lo. 4,928 c.
Wm. Kerrigan, *Supt*....St. Louis, Mo.
St. Louis Div.: W. H. Harris, *M. M.*..De Soto, Mo.
Ark. Div.: *Supt*....Little Rock, Ark.
R. M. Richardson, *M. M*....Little Rock, Ark.
(5) Int. & G. No.: John Herrin, *Supt.*..Palestine, Tex.
W. S. Morris, *M. M*....Palestine, Tex.
(6) Tex. & Pac.: W. Cummings, *Supt.* Marshall, Tex.
E. N. O. & Tr. Cont. Divs.:
Geo. Dimick, *Supt*....Marshall, Tex.
E. A. Haggerty, *M. M*....Marshall, Tex.
E. R. Smith, *M. M. & M. C. B.*..N. Orleans, La.
Rio Grande Div.:
L. L. Keller, *Supt*....Big Springs, Tex.
J. K. Lape, *M. M*....Big Springs, Tex.
Mobile & Ala. Grand Trunk R. R. 5 g. 59 m. 2 lo. 23 c.
Wm. H. Pratt, *Trustee*....Mobile, Ala.
Mobile & Girard R. R. 5 g. 84 m. 7 lo. 112 cars
W. L. Clark, *Gen. Supt*....Columbus, Ga.
J. C. Albrecht, *M. M*....Columbus, Ga.
A. J. Nix, *M. C. B*....Columbus, Ga.
Mobile & Montgomery Ry. (*See Louis. & Nash.*)
Mobile & Northwestern R. R. 3 g. 31 m. 2 lo. 16 c.
Thomas T. A. Lyon, *Pres*....Glendale, Miss.
Mobile & Ohio R. R. 5 g. 528 m. 75 lo. 1,353 cars.
G. Jordan, *V.-Pr. & Gen. Man*....Mobile, Ala.
F. Jordan, *Pur. Agt*....Mobile, Ala.
M. T. Carson, *Gen. M. M*....Whistler, Ala.
J. T. Booth, *M. C. B*....Whistler, Ala.
So'n Div.: J. G. Motley, *Supt*....Mobile, Ala.
L. J. Morris, *M. M*....Macon, Miss.
No'n Div.: E. S. Hosford, *Supt.*..Jackson, Tenn.
H. C. Goode, *M. M*....Jackson, Tenn.
Mobile & Spring Hill R. R. 5-2 g. 8 m. 1 lo. 16 cars.
F. Ingate, *Manager*....Mobile, Ala.
Moline & Southeastern R. R. 3-6 g. 8 m. 2 lo. 26 c.
R. Battersly, *Gen. Man*....Coal Valley, Ill.
Mont Alto R. R. 4-9 g. 21 m. 2 lo. 8 cars.
G. B. Wiestling, *Supt. & P. A.*...Mont Alto, Pa.
Montgomery & Eufaula Ry. (*See Cen. of Ga.*)
Montgomery Southern Ry. 3 g. 20 m. 1 lo. 15 cars.
S. D. Hubbard, Jr., *Gen. Man.* Montgomery, Ala.
Montour R. R. 4-8½ g. 12 m. 2 lo. 130 cars.
C. R. Brown, *Supt. & Pur. Agt.*..Imperial, Pa.
Henry Newman, *M. C. B*....Imperial, Pa.
Montpelier & Wells Riv. R. R. 4-8½ g. 38 m. 3 lo. 86 c.
W. A. Stowell, *Supt*....Montpelier, Vt.
Montreal Portland & Boston Ry. (*See Passumpsic.*)
Montreal & Sorel Ry. 4-8½ g. 47 m. 3 lo. 35 c.
C. N. Armstrong, *G. M. & Pur. Agt.* Sorel, Que.
J. F. Armstrong, *Gen. Supt*....Sorel, Que.
G. W. Pangborn, *M. M*....Sorel, Que.
Montrose Ry. 3 g. 28 m. 3 lo. 24 cars.
T. G. Walter, *Gen. Supt*...Tunkhannock, Pa.
Morgan's Louis. & Tex. R. R. 4-8½ g. 242 m. 46 l. 1,339 c.
J. Kruttschnitt, *Supt*....New Orleans, La.
C. Trumpy, *Pur. Agt*....New Orleans, La.
J. D. Connell, *M. M*....Algiers, La.
Jno. Hildebrand, *M. C. B*....Algiers, La.
Mount Washington R. R. 5-3 g. 3 m. 6 lo. 6 cars.
Walter Aiken, *Gen. Man*....Franklin, N. H.
Muncy Creek Ry. (*See Wmspt. & No. Br.*)

N

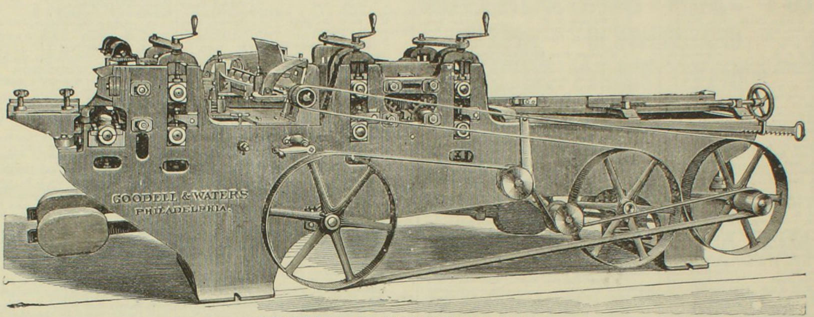
Nantasket Beach R. R. 4-8½ g. 6 m. 5 lo. 25 c.
George L. Keyes, *Gen. Supt*....Boston, Mass.
Naugatuck R. R. 3 g. 4 m. 17 lo. 547 cars.
Geo. W. Beach, *Supt*....Waterbury, Conn.
H. A. Bishop, *Pur. Agt*....Bridgeport, Conn.
H'y D. Beach, *Supt. R. S.*...Bridgeport, Conn.
Napanee, Tamworth & Quebec Ry. In progress.
Ed. W. Rathbun, *Man. Dir*....Deseronto, Ont
R. C. Carter, *Supt*....Deseronto, Ont.
Narragansett Pier R. R. 4-8½ g. 8 m. 2 lo. 11 c.
G. T. Lanphear, *Supt. & Pur. Agt.* Peacedale, R. I.
Nashua & Rochester R. R. (*See Wor. & Nash.*)
Nashville, Chattanooga & St. Louis Ry.
5 g. 539 miles 87 lo. 1,979 cars.
J. W. Thomas, *G. Man. & P. Agt.* Nashville, Tenn.
M. J. C. Wrenne, *Supt*....Nashville, Tenn.
James Cullen, *M. M. & C. B.*..Nashville, Tenn.
Nashville & Florence R. R. 5 g. 20 m.
J. T. Craik, *Supt*....Columbia, Tenn.
Natchez, Jackson & Col. R. R. 3-6 g. 100 m. 7 lo. 92 c.
E. D. Frost, *Gen. Supt*....Natchez, Miss.
National Car Company. 4,000 freight cars.
L. Millis, *Pres*....Boston, Mass.
F. Stewart Stranahan, *Sec. & Tr.* St. Albans, Vt.
John B. Fletcher, *Supt*....St. Albans, Vt.
Nebraska, Topeka, Iola & Memphis R. R. 4-8½ g. 16 m.
H. M. Clarke, *Gen. Man*....Girard, Kan.
C. H. Malin, *Gen. Supt*....Girard, Kan.
Nevada Central R. R. (*See Union Pac.; (7) Div.*)
Nevada County N. G. R. R. 3 g. 23 m. 3 lo. 46 cars.
John F. Kidder, *Supt*....Grass Valley, Cal.
Jas. McCormick, *M. M. & C. B.* Grass Valley, Cal.
Nevada & Oregon R. R. 3 g. 30 m. 25 cars.
D. W. Balch, *Supt*....Reno, Nev.
New Brunswick Ry. 4-8½ g. 419 m. 20 lo. 357 cars.
E. R. Burpee, *Gen. Man*....Woodstock, N. B.
Jesse Mathews, *M. M*....Gibson, N. B.
T. N. Burpee, *M. C. B.*...McAdam Junc., N. B.
J. J. Seely, *Pur. Agt*....Woodstock, N. B.
Thos. Armstrong, *M. M*....St. Andrew's, N. B.
G. Houlton, *M. C. B*....St. Andrew's, N. B.
New Brunswick & Can. Ry. (*See New Brun.*)
New Castle R. R. 3-6 g. 5 m. 2 lo. 76 cars.
Geo. Pearson, *Gen. Man*....New Castle, Pa.
New Castle & Beaver Valley R. R. (*See Penna. Co.*)
New Haven & Derby R. R. 4-8½ g. 13 m. 4 lo. 70 c.
E. S. Quintard, *Supt*....New Haven, Conn.
J. M. Whitlock, *M. M. & C. B.* New Haven, Conn.
New Haven & No'mpton. 4-8½ g. 170 m. 27 lo. 598 c.
S. B. Opdyke, Jr., *Supt*....New Haven, Ct.
R. G. Curtis, *Pur. Agt*....New Haven, Ct.
Henry Fox, *M. M*....New Haven, Ct.
John Sweeny, *For Car Shps*...New Haven, Ct.
New Jersey & New York Ry. 4-8½ g. 37 m. 6 lo. 40 c.
J. D. Hasbrouck, *Gen. Man* Jersey City, N. J.
J. S. Drake, *Supt. & M. M*....Hillsdale, N. J.
L. B. Van Wagonen, *M. C. B*....Hillsdale, N. J.
N. J. Southern Ry. (*See Phil. & Read.; N. J. So. Div.*)
New London Northern R. R. (*See Central Ver.*)
New Orleans, B. Rouge, Vicks. & Memphis.
Jas. M. Edwards, *Gen. Man.*..New Orleans, La.
John Bradley, *Supt*....New Orleans, La.
New Orleans Pacific Ry. (*See Mo. Pac.; (6) Div.*)
New Orleans & Carrollton R. R.
4-8½ g. 15 m. 12 lo. 79 cars.
C. V. Haile, *Supt*....New Orleans, La.
John Dahmer, *M. M*....New Orleans, La.
Jas. Thorn, *M. C. B.*....New Orleans, La.
New Orleans & Mobile R. R. (*See Louis. & Nash.*)
N. O. & Northeastern R. R. (*See Cin., N. O. & Tex. Pac.*)
New Orleans & Selma R. R. 5 g. 21 m. 1 lo. 8 cars.
L. B. Schofield, Supt....Selma, Ala.
N. Y. Central & Hudson River R. R.
4-8½ g. 983 m. 676 lo. 25,161 cars.
J. M. Toucey, *Gen. Supt*....New York, N. Y.
R. C. Moore, *Pur. Agt*....New York, N. Y.
Wm. Buchanan, *Supt. M. P.*..New York, N. Y.
L. Garey, *Supt. Car Dept*....New York, N. Y.
N. Y. & Har. Div.: C. M. Bissell, *Supt.* do.
P. McQ. Gibson, *M. M*....New York, N. Y.
Hud. Riv. Div.: C. M. Bissell, *Supt.* N. York, N. Y.
Peter Smith, *M. C. B*....New York, N. Y.
E'n Div.: Zenas C. Priest, *Supt*....Utica, N. Y.
John Ortton, *M. M*....West Albany, N. Y.
L. Packard, *M. C. B*....West Albany, N. Y.
W'n Div.: Geo. H. Burrows, *Supt.* Rochester, N. Y.
S. L. White, *M. M*....Syracuse, N. Y.
Amos Gould, *M. M*....E. Buffalo, N. Y.
E. Chamberlain, *M. C. B*...E. Buffalo, N. Y.
C. H. Burchard, *M. C. B.*..E. Rochester, N. Y.
Rd. Donaby, *M. C. B*....Niagara Falls, N. Y.
N. Y. Chic. & St. L. Ry. 4-8½ g. 513 m. 115 lo. 4,838 c.
Lewis Williams, *Gen. Man*....Cleveland, O.
Jno. Mackenzie, *Supt. M. P.*....Cleveland, O.
Eas'tn Div.: G. H. Kimball, *Supt*...Cleveland, O.
E. A. Miller, *M. M*....Conneaut, O.
West'n Div.: A. H. Evans, *Supt*....Chicago, Ill.
Jas. Eckrord, *M. M*....Bellevue, O.
New York City & Northern. 4-8½ g. 54 m. 17 lo. 368 c.
Frank S. Gannon, *Gen. Supt.* High Bridge, N. Y
Tho. Millen, *M. M*....High Bridge, N. Y.
New York, Lackawanna & W'n Ry. (*See Del. L. & W.*)
New York, Lake Erie & Western R. R.
E. S. Bowen, *V. Pr*....New York, N. Y.
(1) N. Y., L. E. & W. Div.: 4-8½ g. 1,073 m. 576 lo. 30,553 c.
B. Thomas, *Gen. Supt*....Jersey City, N. J.
J. A. Hardenburgh, *Pur. Agt.* New York, N. Y.
F. M. Wilder, *Supt. M. P. & M.*..Susqueh'a, Pa.
E'n Div.: E. O. Hill, *Supt*....Jersey City, N. J.
J. H. Vreeland, *M. M*....Jersey City, N. J.
J. N. Mileham, *M. C. B.*....Jersey City, N. J.
Del. Div.: W. J. Murphy, *Supt.*..Port Jervis, N. Y.
J. Van Vechten, *M. M. & C. B.* Pt. Jervis, N. Y.
Susq. Div.: J. Jolls, *Supt*....Elmira, N. Y.
V. Blackburn, *M. M*....Susquehanna, Pa.
D. B. Goodell, *M. C. B*....Elmira, N. Y.
Buf. & R. Divs.: Chas. Neilson, *Supt.*; and
G. B. Ross, *M. M*....Buffalo, N. Y.
M. Wilder, *M. C. B*....Buffalo, N. Y.
B. & S.-W. Div.: C. A. Brunn, *Supt* do.
W'n Div.: W. B. Coffin, *Supt.*..Hornellsville, N. Y.
Geo. H. Griggs, *M. M*....Hornellsville, N. Y.
N. Y. & Greenwood L. Ry. 4-8½ g. 44 m. 8 lo. 53 c.
Stephen Smith, *Supt*....Jersey City, N. J.
F. A. Stinard, *M. M*....Pompton, N. J.
(2) N. Y., Pa & O. Div: 4-8½ g. 565 m. 221 lo. 7,794 c.
J. M. Ferris, *Gen. Supt*....Cleveland, Ohio.
J. H. Holway, *Pur. Agt*....Cleveland, Ohio.
Wm. Fuller, *Gen. M. M. & C. B.*..Cleveland, O.
S. V. Smith, *Asst. Gen. M. C. B.*...Kent, Ohio.
E'n Div.: A. L. Dunbar, *Supt*....Meadville, Pa.
J. A. Cooper, *M. M*....Meadville, Pa.
D. S. Dockstader, *M. C. Rep*...Meadville, Pa
W'n Div.: T. A. Phillips, *Supt*....Galion, O.
Wm. Hill, *M. M*....Galion, O.
J. W. Holmes, *For. Car Rep*....Galion, O.
Geo. Wilson, *For. Car Rep*....Dayton, Ohio.
Maho'g Div.: N. F. Wood, *Supt*....Cleveland, O.
N. Wright, *M. M*....Cleveland, O.
C. N. Thorp, *M. C. Rep*....Cleveland, O.
New York, New Haven & Hartford R. R.
4-8½ g. 203 m. 123 lo. 2,768 cars.
E. M. Reed, *V. P. & Gen. Man.*..New Haven, Ct.
R. N. Dowd, *Pur. Agt*....New Haven, Ct.
N. Y. & N. H. Div.: W. H. Stevenson, *Supt*...N. Y.
Shore Line and Air Line Divs.:
O. M. Shepard, *Supt*....N. Haven, Ct.
John Henny, Jr., *Supt. M. P.*..New Haven, Ct
Jas. Denver, *M. C. B*....New Haven, Ct
Hart. Div.: C. S. Davidson, *Supt*....Hartford, Ct.
Supt. M. P. & M. C. B.... do.
N. Y., Ontario & Western Ry. (*See N. Y., W. Sh. & Buf.*)
N. Y., Pittsb'h & Chicago. 4-8½ g. 20 m. 2 lo. 32 c.
Geo. W. Dixon, *Supt*....New Galilee, Pa.
H. T. Hanna, *Pur. Agt*....Pittsburgh, Pa.
N. Y., Pennsylvania & Ohio R. R. (*See N. Y., L. E. & W.*)
New York, Philadelphia & Norfolk R. R.
4-8½ g. 10 m. 1 lo. 4 cars.
Jas. McConkey, *Supt*....Princess Ann, Md.
New York, Providence & Boston R. R.
4-8½ g. 83 m. 29 lo. 430 cars.
J. B. Gardner, *Supt*....Providence, R. I.
Giles F. Ward, *Pur. Agt*....Stonington, Conn.
J. H. Anderson, *M. M. & C. B.* Providence, R. I.
N. Y., Susqueh'na & W'n. 4-9 g. 147 m. 33 lo. 1,469 c.
F. A. Potts, *Gen. Man*....New York, N. Y.
C. D. McKelvey, *Asst. Supt.* Jersey City, N. J.
C. T. Demarest, *Pur. Agt*....New York, N. Y.
W. C. Ennis, *M. M. & C. B.*..Wortendyke, N. J.
New York, Texas & Mexican Ry.
4-8½ g. 92 m. 6 lo. 95 cars.
Allen McCoy, *Gen. Man*....Victoria, Tex.
J. G. Conlon, *M. M*....Victoria, Tex.
New York, West Shore & Buffalo.
4-8½ g. 850 m. 98 lo. 2,907 c.
J. D. Layng, *Gen. Man*....New York, N. Y.
C. D. Gorham, *Gen. Supt*....Weehawken, N. J.
P. S. Bemis, *Pur. Agt*....New York, N. Y.
R. H. Soule, *Supt. M. P*....Frankfort, N. Y.
H. R. Div.: C. W. Bradley, *Supt.*, Weehawken, N. J.
Harry Linn, *M. M*....New Durham, N. J.
Moh'k Div.: H. W. Gardiner, *Supt.* Syracuse, N. Y.
Buff. Div.: D. B. McCoy, *Supt*....Buffalo, N. Y.
New York, Ontario & Western.
J. E. Childs, *Gen. Supt*....New York, N. Y.
N. Y. Woodhaven & Rockaway R. R. (*See Long Is.*)
N. Y. & Greenwood Lake Ry. (*See N. Y., L. E. & W.*)
N. Y. & Manhattan Beach Ry. (*See Long Island.*)
New York & Long Branch R. R. (*See Phil. & Read.*)
New York & New England R. R.
4-8½ g. 473 m. 145 lo. 3,959 cars.
W. H. Turner, *Gen. Supt*....Boston, Mass.
W. W. McKim, *Pur. Agt*....Boston, Mass.
J. B. Henney, *Supt. M. P.*....Boston, Mass.
Geo. E. Boyden, *M. M*....Norwood, Mass.
Elias E. Pratt, *M. C. B*....Norwood, Mass.
East Div: E. G. Allen, *Supt*....Boston, Mass.
Nor. Div.: P. St. M. Andrews, *Supt*...Norwich, Ct.
W. A. Stone, *M. M*....Norwich, Ct.
Prov. Div.: L. W. Palmer, *Supt*..Providence, R. I.
Hfd. Div.: E. Holbrook, *Supt*....Hartford, Ct.
E. M. Humstone, *M. M*....Hartford, Ct.
West'n Div.: C. H. Platt, *Supt*....Fishkill, N. Y.
Woons'kt Div.:
E. N. Tucker, *Supt*....Needham, Mass.
New York & Sea Beach R. R. 4-8½ g. 6 m. 4 lo. 40 c.
C. W. Douglass, *Supt*....Bay Ridge, N. Y.
W. A. Sheldon, *Supt*....Bay Ridge, N. Y.
Newark, Somerset & Straitsville R. R. (*See B. & O.*)
Newburg, Dutchess & Conn. R. R. 4-8½ g. 59 miles.
C. L. Kimball, *Gen. Supt*....Matteawan, N. Y.
W. G. Van Buskirk, *M. M. & C. B.*, Dutchess Junction, N. Y
Newfoundland Ry. 3-6 g. 45 m. 7 lo. 41 c.
C. X. Hobbs, *Gen. Man*....St. John's, N'f'd.
Norfolk Southern R. R. 4-8½ g. 74 m. 7 lo. 182 c.
M. K. King, *Gen. Man. & Pur. Agt.* Norfolk, Va.
J. S. Whitworth, *M. M. & C. B*....Norfolk, Va.
Norfolk & Ocean View Narrow Gauge R. R.
3 g. 8 m. 2 lo. 9 cars.
W. H. Taylor, *Pres*....Norfolk, Va.
Norfolk & Western R. R. (*See Shenandoah Val.*)
North-Eastern R. R. of Ga. 5 g. 72 m. 2 lo. 20 cars.
H. R. Bernard, *Supt*....Athens, Ga.
North-Eastern R. R. (S. C.) (*See Wil. & Wel.*)
North Pacific Coast R. R. 3 g. 84 m. 12 lo. 320 cars.
David Nye, *Gen. Supt*....San Rafael, Cal.
W. F. Russell, *Pur. Agt*....San Francisco, Cal.
E. L. Reese, *M. M*....Saucelito, Cal.
North Shore Ry. 4-8½ g. 209 m. 21 lo. 564 c.
W. Wainwright, *Gen. Man*....Montreal, Can.
A. Davis, *Supt. & Pur. Agt*....Quebec, Can
Northern (N. H.), and Concord & Claremont Rys.
4-8½ g. 173 m. 25 lo. 569 cars.
Geo. E. Todd, *Supt*....Concord, N. H.
M. M. & C. B. & Pur. Agt.. do.
Northern (N. J.) R. R. (*See N. Y., L. E. & W'n.*)
Northern Central Ry. (*See Penna. R. R. (6) Div.*)
North'n Pacific R. R. 4-8½ g. 2,207 m. 391 lo. 9,897 c.
T. F. Oakes, *Gen. Man*....St. Paul, Minn.
John H. Ames, *Gen. Pur. Agt*..St. Paul, Minn.
Geo. W. Cushing, *Supt. M. P., M. & R. S.* do.
J. C. Barber, *M. C. B*....Brainerd, Minn.
(1) E'n Div.: J. T. Odell, *A. Gen. Man.* St. Paul, Minn.
H. J. Small, *A. S. Mach*....Brainerd, Minn.
1st Gr. Div.: M. C. Kimberly, *Supt.* Brainerd, Minn.
Frank Howard, *M. C. B*....Brainerd, Minn.
2d Gr. Div.: J. M. Graham, *Supt.* Jamestown, Dak.
C. C. Quinn, *M. M*....Fargo, Dak.
A. Bardsley, *M. M*....Mandan, Dak.
F. Greene, *A. Supt*....Mandan, Dak.
3d Gr. Div.: S. R. Ainslie, *Supt*.. Glendive, Mont.
S. L. Bean, *M. M*....Glendive, Mont.
J. C. Munro, *M. M*....Livingston, Mont.
(2) W'n Div.: J. M. Buckley, *Asst. Gen. Man.* New Tacoma, W. T.
H. D. Sanborn, *P. Agt*....Portland, Ore.
W. T. Small, *A. S. Mach*....Portland, Ore.
4th Gr. Div.: J. B. Cable, *Supt*...Missoula, Mont.
Jas. Walsh, *M. M*....Missoula, Mont.
J. Evans, *M. M*....Sprague, W. T.
5th Gr. Div.: Otis Sprague, *Supt*...Tacoma, W. T.
H. H. Warner, *M. M*....Tacoma, W. T.
Northern & North-W'n Rys. 4-8½ g. 378 m. 50 lo. 1,195 c.
James Webster, *Supt*....Toronto, Can.
W. C. Schreeber, *Pur. Agt*....Toronto, Can.
P. Clarke, *M. M*....Toronto, Can.
Nova Scotia Ry. 4-8½ g. 79 m. 9 lo. 268 c.
C. A. Scott, *Gen. Man*....New Glasgow, N. S.
M. F. Punch, *M. M*....New Glasgow, N. S.

O

Ogdensburg & Lake Champlain R. R.
4-8½ g. 122 m. 33 lo. 1,694 cars.
A. A. Gaddis, *Gen. Man*....Ogdensburg, N. Y.
E. B. Burnham, *Pur. Agt*...Ogdensburg, N. Y.
Abr. Klohs, *Supt. & M. M*....Malone, N. Y.
J. N. Brown, *Master Builder.* Ogdensburg, N. Y.
Ohio Central R. R. 4-8½ g. 325 m. 46 lo. 4,760 cars.
John E. Martin, *Rec*....Toledo, O.
T. M. Peelar, *Supt*....Bucyrus, O.
F. W. Stewart, *Pur. Agt*....Toledo, O.
J. B. Morgan, *M. M. & C. B*....Bucyrus, O.
Ohio Southern R. R. (*See Ind., Bloom. & W'n.*)
Ohio & Mississippi Ry. 4-9 g. 616 m. 113 lo. 2,501 cars.
W. W. Peabody, *Pres. & Gen. Man.* Cincinnati, O.
G. E. Atwood, *Pur. Agt*....Cincinnati, O.
J. H. Setchel, *Gen. M. M*....Cincinnati, O.
Cin. Div.: C. B. Cole, *Supt*....Seymour, Ind.
E. E. Jenks, *A. Gen. For*....Seymour, Ind.
J. P. Coulter, *M. C. B*....Aurora, Ind.
Arthur Donaldson, *M. M*....Vincennes, Ind.
St. L. & Sp. Div.: C. M. Stanton, *Supt.* St. Louis, Mo.
J. W. Stokes, *M. M.* (Spring. Div.)..Pana, Ill.
Louisv. Div.: C. B. Cole, *Supt*....Louisville, Ky.
Oil City & Chicago R. R. (*See Buff., N. Y. & Phil.*)
Old Colony R. R. 4-8½ g. 470 m. 124 lo. 3,527 cars.
J. R. Kendrick, *Gen. Man*....Boston, Mass.
R. W. Husted, *Pur. Agt*....Boston, Mass.
Jas. N. Lauder, *Supt. R. S.*....Boston, Mass.
Sam. Stevens, *S. Br. & Bld'gs*....Boston, Mass.
Main Li. Div.: J. H. French, *Supt*...Boston, Mass.
C. Berkley Powell, *M. M*....Boston, Mass.
Cape Cod Div.: C. H. Nye, *Supt*..Hyannis, Mass.
C. Berkley Powell, *M. M*....Boston, Mass.
No. Div.: S. A. Webber, *Supt*....Fitchburg, Mass.
F. M. Twombly, *M. M*....Taunton, Mass
Oregon Ry. & Navigation Co.
3 & 4-8½ g. 577 m. 72 lo. 1,611 cars.
C. H. Prescott, *V. P. & Gen. Man.* Portland, Ore.
F. T. Dodge, *Supt.* (Riv. Div.)....Portland, Ore.
H. S. Rowe, *Supt.* (Ry Div.)....Portland, Ore.
J. M. Drake, *Pur. Agt*....Portland, Ore.
Goodall, Perkins & Co., *Supt.* (Ocean Div.) San Francisco, Cal.
C. C. Hobart, *Gen. M. M*....The Dalles, Ore
Chas. A. Phipps, *M. C. B*....The Dalles, Ore.
Oregon & California R. R. 4-8½ g. 449 m. 43 lo. 626 c.
R. Koehler, *Gen. Man*....Portland, Ore.
J. Brandt, *Gen. Supt*....Portland, Ore.
W. T. Bodley, *Pur. Agt*....Portland, Ore.
A. Brandt, *M. M*....Portland, Ore.
Owensboro & Nashville R. R. 5 g. 44 m. 3 lo. 70 c.
M. Newbold, *Supt*....Owensboro, Ky.
H. M. Gabel, *M. M. & C. B.*...Owensboro, Ky.
Oxford & Henderson R. R. 4-8½ g. 13 m. 2 lo. 11 c.
James A. White, *Gen. Supt*...Henderson, N. C.

Goodell & Waters

PHILADELPHIA, PA.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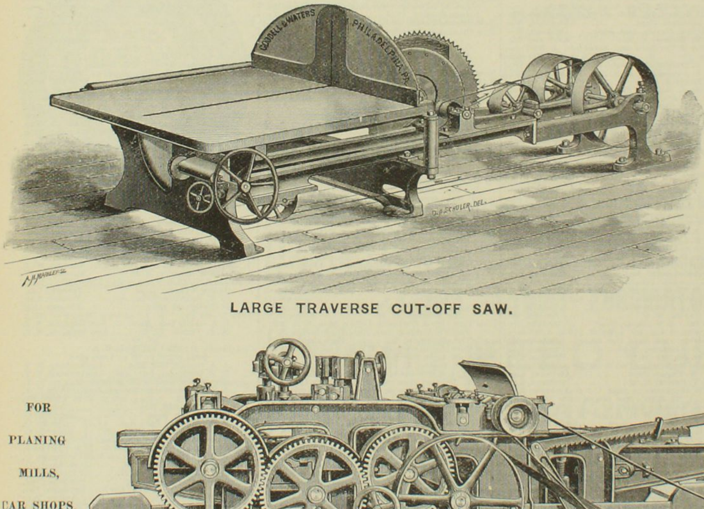
KEYSTONE FLOORING MACHINE.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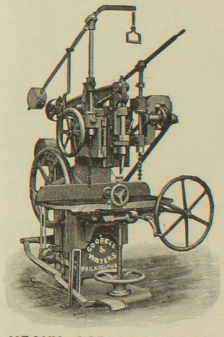
LARGE TRAVERSE CUT-OFF SAW.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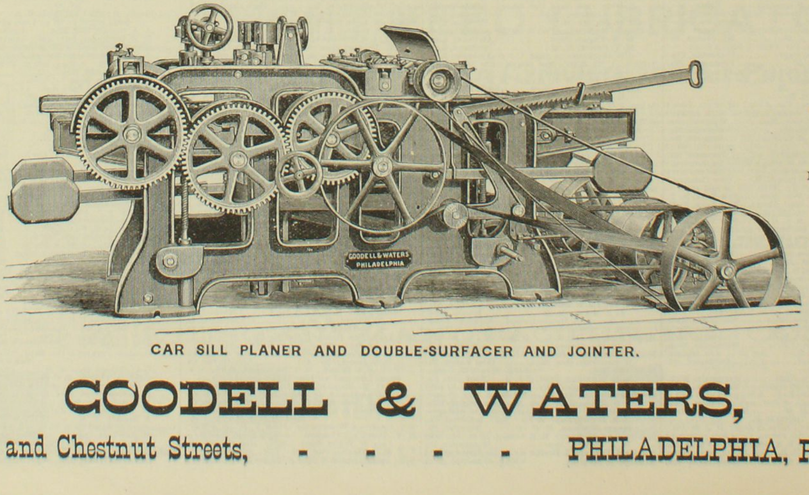
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31st and Chestnut Streets, - - - - PHILADELPHIA, PA.

James E. Lawrence, *M. M*....Henderson, N. C.

P

Pacific Coast Ry. 3 g. 64 m.
J. M. Fillmore, *Manager* San Luis Obispo, Cal.
W. H. Masterman, *M. M. & C. B.* do.
Painesville & Youngstown Ry. 3 g. 65 m. 7 lo. 319 c.
R. K. Paige, *Rec. & Man*.........Painesville, O.
J. A. Newcome, *Supt. R. S*......Painesville, O.
Panama R. R. 5 g. 48 m. 14 lo. 2,200 cars.
G. A. Burt, *Gen. Supt*..... Aspinwall, U. S. Col.
E. Z. Penfield, *Pur. Agt*.......New York, N. Y.
Jas. Reilly, *M. M*..........Aspinwall, U. S. Col
Passumpsic R. R. 4-8½ g. 147 m. 28 lo. 1,101 cars.
E. Raymond, *Pres. & Pur. Agt*.. Boston, Mass.
H. E. Folsom, *Supt*............Lyndonville, Vt.
L. L. Brigham, *M. M*......... Lyndonville, Vt.
L. F. Woodard, *M. C. B* ....Lyndonville, Vt.
Paulding & Cecil Railway. 4-8½ g. 7 m. 3 lo. 28 c.
S. Frank Eagle, *Pres*.......................Cecil, O.
Paw Paw and Toledo & South Haven R. Rds.
3 g. 20 m. 3 lo. 16 cars.
John Ihling, *Supt*....... ....Lawton, Mich.
Peach Bottom R. R. 3 g. 55 m. 6 lo. 52 cars.
B. B. Newton, *Supt. & Pur. Agt*...Oxford, Pa.
E. H. Williams, *M. C. B*..............York, Pa.
W. P. Kirk, *M. M*.....................Oxford, Pa.
Pemigewasset Valley R. R. 4-8½ g. 21 m. 2 lo. 127c.
J. Thomas Vose, *Pres*........ ...Boston, Mass.
Pennsylvania Co.'s (5) Roads.
4-9 g. 3,222 m. 920 lo. 32,809 cars.
Gen. Divs. (1), (2), (3), (4) and (5).
Wm. A. Baldwin, *Gen. Man*.....Pittsburg, Pa.
John Thomas, *Gen. Supt*...... Pittsburg, Pa.
Wm. Mullins, *Gen. Pur. Agt*......Pittsburg, Pa.
Joseph Wood, *Supt. M. P*.... .Fort Wayne, Ind.
(1) Pittsburg, Ft. Wayne & Chicago Ry.
4-9 g. 468 m. 288 lo. 8,023 cars.
E'n Div.: A. B. Starr, *Supt*.......Allegheny, Pa.
Geo. J. Parkin, *M. M*..... ....Allegheny, Pa.
D. M. Peppard, *M. M*........ . Crestline, O.
W'n Div.: C. D. Law, *Supt*.....Ft. Wayne, Ind.
F. D. Casanave, *M. M*........Ft. Wayne, Ind.
A. H. Somers, *Gen. For. Shops*...Chicago, Ill.
(2) Ashtabula & Pittsburg, and
(3) Erie & Pittsburg R. Rds. 221 m. 29 lo. 1,362 c.
John M. Kimball, *Supt*..Lawrence Junc., Pa.
J. A. Wood, *Gen. For. Shops*........Erie, Pa.
(4) Cleveland & Pittsb'g R. R. 225 m. 97 lo. 3,534 c.
R. F. Smith, *Asst. Man*.... .....Cleveland, O.
Philip Bruner, *Supt*............Wellsville, O.
W. F. Beardsley, *Mast. of Mach.* Wellsville, O.
(5) Nc-W'n Ohio Ry.: J. S. Morris, *Supt*...Toledo, O.
Pennsylvania R. R. Co.'s Roads. (7 Gen. Divs.)
4-9 g. 3,158 m. 1,459 loco. 66,816 cars.
Chas. E. Pugh, *Gen Man*......Philadelphia, Pa.
Enoch Lewis, *Pur. Agt*.......Philadelphia, Pa.
John Reilly, *Supt. Trans*......Philadelphia, Pa.
T. N. Ely, *Gen S. M. P*.............Altoona, Pa.
Pennsylvania R. R. Divs.
4-9 g. 1,213 m. 705 lo. 46,819 cars.
S. M. Prevost, *Gen Supt*. ... .Altoona, Pa
Frank L. Sheppard, *Supt. M. P*..Altoona, Pa.
G. W. Strattan, *M. M*.. ....Altoona, Pa.
Jno. P. Levan, *Gen. Fore*... ....Altoona, Pa.
Phila. Div.: Tho. Gucker, *Supt*. Philadelphia, Pa.
H. D. Garrett, *M. M*....W. Philadelphia, Pa.
I. W. Van Houten, *Gen. For*....W. Phila., Pa.
Mid. Div.: O. E. McClellan, *Supt*. Harrisburg, Pa.
E. L. Caum, *M. M*...........Harrisburg, Pa.
Samuel W. Myers, *Gen. For*. Harrisburg, Pa.
Altoona Div.: Jas. Reed, *Supt*.......Altoona, Pa.
Pitts. Div.: Robert Pitcairn, *Supt*....Pittsburg, Pa.
D. O. Shaver, *M. M*..............Pittsburg, Pa.
J. G. Stewart, *Gen. For*........Pittsburg, Pa.
W. Pa. Div.: A. P. Kirtland, *Supt*. Blairsville, Pa.
Wm. B. Norris, *M. M*..........Blairsville, Pa.
M. H. Fails, *Gen. For*..........Blairsville, Pa
Fred. Div.: J. B. Hutchinson, *Supt*.....York, Pa
Tyrone Div.: S. S. Blair, *Supt*........Tyrone, Pa.
Lew. Div.: Wm. M. Phillips, *Supt*. Lewistown, Pa.
Bed. Div.: R. L. Holliday, *Supt*......Bedford, Pa.
Monong. Div.: David M. Watt, *Supt*. Pittsburg, Pa.
Wm. Lininger, *M. M*....... ....Pittsburg, Pa
(2) United R. Rs. of N. J. Divs. 471 m. 330 lo. 4,041 c.
F. Wolcott Jackson, *Gen. St*. Jersey City, N. J.
H. S. Hayward, *Supt. M. P*.. Jersey City, N. J.
David H. Baker, *Gen. For*... Jersey City, N. J.
N.Y. Div.: Robt. E. Pettit, *Supt*. Jersey City, N. J.
L. A. Bosdevex, *M. M*. ..Jersey City, N. J.
E. F. Bosdevex, *Gen. For*.. Jersey City, N. J.
Bel. Div.: J. A. Anderson, *Supt*. Lambertv., N. J.
R. McDowell, *M. M*.......Lambertville, N. J.
Amboy Div: I. S. Buckalew, *Supt*. Camden, N. J.
Thos. Kerr, *M. M*....... ....So. Amboy, N. J.
P. S. Bogart, *Gen. For*......So. Amboy, N. J.
(2½) Camden & At. Rd.: 75 m. 18 l. 261 c.
W. N. Bannard, *Supt*............... and
Rufus Hill, *M. M*.. ....Camden, N. J.
Samuel Wills, *M. C. B*...... ..Camden, N. J.
(3) West Jersey R. R. 4-9 g. 188 m. 27 lo. 294 cars.
Joseph Crawford, *Gen. Supt* ....Camden, N. J
W McAlister, *M. M*.... ....Camden, N. J.
C. C. Williams, *Gen. For*........Camden, N. J.
(4) Phila., Wilm. & Balt. R.R. 409 m. 128 lo. 1,882 c.
H. F. Kenney, *Gen. Supt* .....Philadelphia, Pa.
J. M. Wallis, *S. M. P*. ....Philadelphia, Pa.
H. D. Gordon, *M. M*.........Wilmington, Del.
W. H. Lungren, *M. C. B*..... ..Wilmington, Del.
Cen. Div.: L. K. Lodge, *Supt*......... Media, Pa.
Del. Div.: I. N. Mills, *Supt*......Wilmington, Del.
Md. Div.: H. H. Carter, *Supt*.. Wilmington, Del.
(5) Phila. & Erie R. R. Divs.: 437 m. 110 lo. 3,089 c.
R. Neilson, *Gen. Supt*.... ...Williamsport, Pa.
A. O. Dayton, *Supt. Mo. Po*.. Williamsport, Pa.
E'n. Div.: E. B. Westfall, *Supt*. Williamsport, Pa.
Sun. H. & W. Div: A. Walter, *Supt*.; and
H. K. Stout, *M. M*.... ... .Sunbury, Pa.
Mid. Div.: Tho. A. Roberts, *Supt*.....Renovo, Pa.
Wm. L. Holman, *M. M*..........Renovo, Pa.
West'n Div.: J. W. Reynolds, *Supt*.....Erie, Pa.
W. T. Smith, *M. M*............... ...Erie, Pa.
(6) Northern Central Ry. 4-9 g. 346 m. 152 lo. 6,610 c.
Robert Neilson, *Gen. Supt*... Williamsport, Pa.
A. O. Dayton, *Supt. M. P*.... Williamsport, Pa.
A. W. Sumner, *Pur. Agt*... ....Baltimore, Md.
J. M. Coale, *M. M*...............Baltimore, Md.
G. W. Demarest, *Gen. For*......Baltimore, Md.
Susq. Div.: E. B. Westfall, *Supt*. Williamsport, Pa.
Sham. Div.: A. Walter, *Supt*..... ..Sunbury, Pa.
Elm. & Can. Divs.: S. Meade, *Supt*.. Elmira, N.Y.
Jas. Strode, *M. M*..... .. ..Elmira, N. Y.
J. C. Dyott, *Gen. For*.......... ....Elmira, N. Y.
Baltimore Div.: H. W. Kapp, *Supt*. Baltimore, Md.
(7) Balt. & Pot. & Alex. & Fred. 125 m. 30 lo. 360 c.
H. F. Kenny, *Gen. Supt*.......Philadelphia, Pa.
A. W. Sumner, *Pur. Agt*... ....Baltimore, Md.
J. M. Wallis, *Supt. Mo. Po*....Philadelphia, Pa.
H. D. Gordon, *M. M*......... ..Wilmington, Del.
J. Lescallett, *For. Mach. Shop*. Washington, D.C.
R. F. Downs, *For. Car Shop*.. Washington, D.C.
Penn. Coal Co.'s R. R. 4-3 g. 67 m. 23 eng. 3,271 c.
J. B. Smith, *Gen. Supt* ..... .Dunmore, Pa
And. Crane, *M. M*. ....Dunmore, Pa.
Geo. W. Simpson, *M. C. B*........Dunmore, Pa.
Pennsylvania, Slatington & New England R. R.
In progress. 4-8½ g. 18 m. 1 lo. 20 cars.
C. H. Stanton, *Supt*........... New York, N. Y.
Pennsylvania & Erie R. R.—Early Branch.
C. R. Early, *Gen. Supt*...........Ridgeway, Pa.
Pensacola & Atlantic R. R. 5 g. 161 m. 9 lo. 67 cars.
W. D. Chipley, *Gen. Supt*.......Pensacola, Fla.
W. D. Robb, *M. M*............. Pensacola, Fla.
Pensacola & Perdido R. R. 5 g. 10 m. 5 lo. 92 cars.
B. F. Simmons, *Pr. & Supt*.... Pensacola, Fla.
H. W. Simmons, *Pur. Agt*......Pensacola, Fla.
J. C. Schutte, *M. M*..............Pensacola, Fla.
People's Ry. 4-8½ g. 15 m. 2 lo. 14 cars.
W. D. Pollard, *Supt*....... ....Pottsville, Pa.
Peoria, Decatur & Evansville Ry.
4-8½ g. 254 m. 30 lo. 1,660 cars.
G. L. Bradbury, *Gen. Man*.... .... Peoria, Ill.
P. Reilly, *M. M*......................Mattoon, Ill.
Peoria & Farmington R. R. (*See Cen. Ia.*)
Peoria & Pekin Union Ry. 4-8½ g. 20 m. 12 lo. 106 c.
Thos. B. Burnett, *Gen. Supt. & P. A.* Peoria, Ill.
O. W. Bell, *Supt* ....Peoria, Ill.
R. F. Hurd, *M. M. & C. B*.. ....Peoria, Ill.
Perkiomen R. R. 4-8½ gauge 39 miles.
D. B. Clack, *Supt*.....Perkiomen Junction, Pa.
H. Boyd, *Pur. Agt*.............Norristown, Pa.

Petersburg R. R. 4-8½ g. 64 m. 10 lo. 133 cars.
R. M. Sully, *Gen. Supt*........Petersburg, Va.
Geo. F. Jones, *Pur. Agt*.... ...Petersburg, Va.
R. B. Andrews, *M. M*..... .....Petersburg, Va.
J. W. Fleming, *M. C. B*.........Petersburg, Va.
Phila., Wilmington & Balt. R. R. (*See Penna. R. R.*)
Peterborough & Hillsborough. (*See Northern, N. H.*)
Philadelphia, Newtown & N. Y. R. R. 4-8½ g. 23 m.
W. M. Geary, *Supt*............Philadelphia, Pa.
Phila. & Atlantic City Ry. 3-6 g. 55 m. 11 lo. 134 cars.
F. S. Urie, *Supt*.............. .Philadelphia, Pa.
W. S. Wilson, *Pur. Agt*.......Philadelphia, Pa.
H. M. Messimer, *M. M* ....Camden, N. J.
E. Lippincott, *M. C. B*.... ......Camden, N. J.
Philadelphia & Erie R. R. (*See Penna. R. R.; (5) Div.*)
Philadelphia & Reading R. R. (and Branches.)
4-8½ g. 1,582 m. 907 lo. 56,775 cars.
John E. Wootten, *Gen. Man*..Philadelphia, Pa.
W. S. Wilson, *Pur. Agt*......Philadelphia, Pa.
Geo. Eltz, *Supt. Trans*.. .... Reading, Pa.
L. B. Paxson, *Eng. of Mach*...... Reading, Pa.
No. Pa. & Bound Brook Div.:
I. A. Sweigard, *Supt*........Philadelphia, Pa.
Mahanoy & Shamokin and other Brs.:
J. H. Olhausen, *Supt*...........Pottsville, Pa
D. C. Reinhart, *Asst. Supt*. ...Catawissa, Pa.
A. A. Hesser, *Asst. Supt* Mahanoy Plane, Pa.
Schuylkill & Susquehanna Br.:
H. H. Tracy, *Supt* ....Pine Grove, Pa.
Reading & Columbia Br.:
A. M. Wilson, *Supt* ....Columbia, Pa.
(2) N. J. Central Div.:
W. W. Stearns, *Supt*..... .....Elizabeth, N. J.
W. Woodcock, *M. M*.. ....Elizabethport, N. J.
Geo. Hackett, *M. C. B*. ....Elizabethport, N. J.
C. G. Williams, *M. M*.........Jersey City, N. J.
John Alpaugh, *M. M*.........Phillipsburg, N. J.
L. Br. Div.: R. Blodgett, *Supt*...Long Branch, N.J.
N. J. So. Div.: W. W. Stearns, *Supt*. Elizabeth, N. J.
Wm. Montgomery, *M. M*....Manchester, N. J.
Chas. N. Sawyer, *M. C. B*....Manchester, N. J.
Lehigh & Susquehanna Div.:
W. S. Polhemus, *Supt* .. Mauch Chunk, Pa.
Pittsburgh, Bradford & Buffalo Ry. (*See Pitts. & West.*)
Pittsburgh, Chartiers & Youghiogheny R. R.
4-8¾ g. 19 m.
Geo. S. Griscom, *Gen. Man*......Pittsburg, Pa.
Pittsburgh, Cincinnati & St. Louis Ry (5 Gen. Divs.)
4-9 g. 916 m. 239 lo. 7,133 cars.
James McCrea, *Manager*. ....Columbus, O.
Wm. Mullins, *Pur. Agt* ....Pittsburg, Pa.
Edward B. Wall, *Supt M. P*.......Columbus, O
(1) P., C. & St. L. Div.: E. B. Taylor, *Supt* Pittsburg, Pa.
C. B Street, *M. M*.. ....Dennison, O.
J. M. Copeland, *G. F. Car Shops*. Steubenville, O
(2) C. & M. V. Div.: W. F. Black *Supt*..Zanesville, O.
Leroy Kells, *M. M*.. . ...Lancaster, O.
Wm. Meikle, *Gen. For* .... Lancaster, O.
Daniel Jewell, *Gen. F. Car Shops*. Lancaster, O.
(3) Li. Mi. Div.: Ralph Peters, *Supt*....Cincinnati, O.
Leroy Kells, *M. M*.............Cincinnati, O.
Jos. Underwood, *G. F. Car Shops*. Cincinnati, O
(4) J. M. & I. R. R.: E. W. McKenna, *Supt*. Louisville, Ky.
Wm. Swanston, *M. M*. ...Jeffersonville, Ind.
Edw. Austin, *G. F. C. Shops*. Jeffersonville, Ind.
(5) Indianapolis & Vincennes R. R.
J. J. Turner, *Supt* ....Indianapolis, Ind.
Pittsburgh, Cleveland & Toledo R. R.
4-8¾ g. 78 m. 18 lo. 525 cars.
C. H. Andrews, *Pres*. ....Youngstown, O.
W. F. Hofecker, *M. M*... ...Youngstown, O.
Pittsburgh, Ft. Wayne & Chicago Ry. (*See Penna. Co.*)
Pittsburgh Southern Ry. (*See Balt. & O.*)
Pitts. & Castle Shannon R. R. 3-4 g. 9 m. 5 lo. 428 c.
James M. Bailey, *Gen. Supt*... Pittsburgh, Pa.
Holmes Ward, *M. M* ......Castle Shannon, Pa.
Wm. E. Long, *M. C. B* .... Pittsburgh, Pa.
Pitts. & Lake Erie R. R. 4-8¾ g. 70 m. 31 lo. 1,820 c.
W. C. Quincy, *Gen. Man*.........Pittsburgh, Pa.
D. H. Hostetter *Pur. Agt*.... . Pittsburgh, Pa
R. W. Jones, *Mast. Trans*...... Pittsburgh, Pa.
S. W. Haines, *M. M*......... ....Pittsburgh, Pa.
Pittsburgh, McKeesport & Youghiogheny.
4-8¾ g 57 m. 19 lo. 267 cars.
W. C. Quincy, *Gen. Man*...... Pittsburgh, Pa.
R. W. Jones, *M. of Trans*.......Pittsburgh, Pa.
S. W. Haines, *M. M*.......... Pittsburgh, Pa.
Pitts. & Western R. R. 3 & 4-8½ g. 110 m. 18 lo. 365 c.
Pitts., Bradford & Buff. Ry. 3 g. 93 m. 8 lo. 163 c.
Tho. M. King, *Gen. Man*.........Allegheny, Pa.
J. T. Johnson, *Supt*.... ....Allegheny, Pa.
J. Morton Hall, *Pur. Agt*..... ..Allegheny, Pa.
W. M. Flahavhan, *M. M*.........Allegheny, Pa
Pontiac, Oxford & Pt. Austin R. R. 100 m.
Geo. W. Debevoise, *Pr. & Gen. Man.* Oxford, Mich.
Jas. Houston, *Gen. Supt*...... ..Oxford, Mich.
Port Huron & No.-Western Ry. 3 g. 218 m. 14 lo. 288 c.
H. McMorran, *G. Man. & P. A.* Port Huron, Mich.
J. R. Wadsworth, *Supt*.. ...Port Huron, Mich.
Chas. Deifenbach, *M. M*......Port Huron, Mich.
Benj. Hillier, *M. C. B*........Port Huron, Mich.
Port Jervis & Monticello R. R. 4-8½ g. 24 m. 3 lo. 13 c.
M. V. Heller, *Gen. Man*......Port Jervis, N. Y.
Port Royal & Augusta Ry. 5 g. 180 m. 16 lo. 310c
J. N. Bass, *Supt*..... ....Augusta, Ga.
T. F. Warwick, *M. M. & M. C. B* Augusta, Ga
Portland & Ogdensburg. 4-8½ g. 110 m. 11 lo. 311 c.
J. Hamilton, *Gen. Supt. & P. A*..Portland, Me.
M. M....... ....Portland, Me.
W. G. Brewer, *M. C. B*... . .Portland, Me.
Portland & Rochester R. R. 4-8½ g. 52 m. 7 lo. 230 c.
J. W. Peters, *Supt. & Pur Agt*...Portland, Me.
E. H. C. Tompson, *For. of Mach*..Portland, Me.
David Dow, *For. of Car Repairs* .Portland, Me
Potomac, Fred.'g & Pied. R. R 3 g. 38 m. 2 lo. 38 c.
Will M. Grafton, *Supt*.... ..Fredericksburg, Va.
W. J. Sweigard, *M. M* ....Fredericksburg, Va.
Pough., Hart. & Bos. R. R. 4-8½ g. 45 m. 4 lo. 65 c.
J. A. Perkins, *Supt*........Poughkeepsie, N. Y.
John L. Donaldson, *M. M*. Poughkeepsie, N. Y.
Pratt Coal & Coke Company's R. R. 5 g. 9 m. 5 lo. 100 c.
W. L. Gude, *Gen. Man*.... ...Pratt Mines, Ala.
Prescott & Thirty-Fifth Parallel R. R.
4-8½ g. 77 miles in progress.
Samuel A. Henszey, *Gen. Man*. .Prescott, Ariz.
Prince Edward Island Ry. 3-6 g. 199 m. 18 lo. 280 c.
Jas. Coleman, *Supt. & Pur. Agt.*;
Jos. Unsworth, *M. Supt. & Storekeeper*; and
D. M. Fraser, *M. C. B*.. .Charlottetown, P. E. I.
Profile & Franconia Notch R. R. 3 g. 15 m. 3 lo. 18 c.
Emmons Raymond, *Pur. Agt*.. . Boston, Mass.
C. H. Greenleaf, *Supt*......Profile House, N. H.
Prospect Park & Coney Island R. R.
4-8½ g. 15 m. 8 lo. 123 cars.
R. Schermerhorn, *Supt*.........Brooklyn, N. Y.
Martin Painter, *M. M*............Brooklyn, N. Y.
Prov., Warren & Bristol R. R. 4-8½ g. 19 m. 6 lo. 79 c.
Waterman Stone, *Supt*.. .. ..Providence, R. I.
Rufus Smith, *M. M. & C. B*....... ..Bristol, R. I.
Prov. & Springfield R. R. 4-8½ g. 23 m. 4 lo. 92 c.
Wm. Tinkham, *Gen. Man*.....Providence, R. I
G. T. Richardson, *M. M*........Providence, R. I.
Prov. & Worcester. 4-8½ g. 66 m. 34 lo. 1,155 c.
W. E. Chamberlain, *Supt* .....Providence, R. I.
A. Griggs, *Supt. L. & C. D*....Providence, R. I.
Pullman's Palace Car Co. 564 passenger cars.
A. B. Pullman, *2d V.-Pr. & G. M*.. Chicago, Ill.
Geo. F. Brown, *Gen. Supt*...... ...Chicago, Ill.
Wm. A. Angell, *Pur. Agt*.......... .Chicago, Ill.
S. W. Bretzfield, *Asst. Pur. Agt*. New York, N.Y.
A. Rapp, *Man*. (Chicago Works)...Chicago, Ill.
H. L. Spaulding, *Man*. (Det. Shops). Detroit, Mich.
E. A. Benson, *Supt. Shops*.... .... St. Louis, Mo.

Q

Quebec Central Ry. 4-8½ g. 147 m. 10 lo. 267 cars.
J. R. Woodward, *Gen. Man*. .Sherbrooke, P. Q.
A. Steele, *Supt*.. .... Sherbrooke, Que.
R. D. Morkill, Jr., *Pur. Agt*..Sherbrooke, P. Q.
Jas. Seiveright, *M. M* ....Sherbrooke, P. Q.
Quebec, Montreal, Ottawa & Occidental Ry.
4-8½ g. 354 m. 36 lo. 993 cars.
L. A. Senecal, *Gen. Supt*........Quebec, Que.
Quebec & Lake St. John Ry. 4-8½ g. 36 m. 3 lo. 55 c.
J. G. Scott, *Manager*............Quebec, Can.
Frank Fournier, *Supt*... ...St. Raymond, P. Q.
John T. Eames, *M. M*.. ....St. Raymond, P. Q.
Queen Anne's & Kent and Townsend Branch R. R.
(*See Penna.; (4) Div.*)

R

Raleigh & Augusta Air-Line; Carolina Central.
Raleigh & Gaston R. Rs. 4-8½ g. 436 m. 50 lo. 994 c.
John C. Winder, *Gen. Man. & P. A.* Raleigh, N. C.
Raleigh Rds. 4-8½ g. 194 m. 22 lo. 563 cars.
B. R. Harding, *Supt. of Mach*. Raleigh, N. C.
Carolina Cen. R.R. 4-8½ g. 242 m. 26 lo. 431 c.
L. C. Jones, *Supt*.... ...Wilmington, N. C.
James Maglenn, *M. of Mach*. Laurinburg, N. C.
S. R. Ethridge, *M. C. B* ...Laurinburg, N. C.
Rensselaer & Saratoga R. R. (*See Del. & Hud. Can. Co.*)
Rhinebeck & Connecticut. (*See Hart. & Ct. Wn.*)
Richmond, Fredericksburg & Potomac R. R.
4-8½ g. 83 m. 15 lo. 146 cars.
E. T. D. Myers, *Gen. Supt* .. Richmond, Va.
T. L. Courtney, *Asst. Supt* ..Richmond, Va.
H. Kuhn, *M. M*........... ...Richmond, Va.
W. H. Trainham, *M. C. B*. ...Richmond, Va.
Richmond & Alleghany R.R. 4-9 g. 261 m. 19 lo. 837c.
Decatur Axtell, *Rec. & Gen. Man*. Richmond, Va.
M. Sweeney, *Pur. Agt*.. .... ..Richmond, Va
Geo. D. Harris, *M. M. & C. B*....Richmond, Va.
Richmond & Danville R. R. Co.'s Roads.
1,736 miles 218 loco. 3,833 cars.
A. L. Rives, *Gen. Man* ....Richmond, Va.
Peyton Randolph, *As. G. Man*..Richmond, Va.
J. P. Minetree, *Pur. Agt*........ Richmond, Va.
R. D. Wade, *Supt. Mo. Po*... ...Richmond, Va.
(1) Rich. & Dan. R. R. 5 g. 847 m. 131 lo. 2,687 cars.
Rich. & Dan. Div.: 5 g. 320 m. 80 lo. 1,797 c
Wm. H. Green, *Supt*...... ....Richmond, Va.
M. M... ....Richmond, Va.
J. B. Vaughan, *For. Car Sh*...Richmond, Va.
North Carolina Div. 5 g. 223 m. 22 lo. 268 cars.
A. B. Andrews, *Supt*.... ......Raleigh, N. C.
W. H. Turrentine, *M. M*. Comp'y's Shops, N. C.
J C. Holt, *For. Car Sh*. Comp'y's Shop N. C.
Atlanta & Char. Air Line. 5 g. 286m. 31 lo. 415 c.
Narrow-Gauge Branches. 3 g. 80 m. 5 lo. 41 c.
Edmund Berkley, *Supt*..... ....Atlanta, Ga.
T. W. Gentry, *M. M*. .. ..Atlanta, Ga.
Z. T. Smith, *For. Car Sh*.... ... Atlanta, Ga.
(2 Charlotte, Col. & Aug. R. R. 5g. 239 m. 22 lo. 287 c.
G. R. Talcott, *Supt*..........Columbia, S. C.
J. H. Green, *M. M.* (2 roads)...Columbia, S. C.
(3) Columbia & Greenville R. R. 5 g. 297 m. 22 l. 224 c.
G. S. Talcott, *Supt*............Columbia, S. C.
J. O Meredith, *For. E. & C. Rep*.. do.
(4) Virginia Midland Ry. 4-8½ g. 353 m. 41 lo. 631 c.
W. M. S. Dunn, *Eng. & Supt*. Alexandria, Va.
J. E. Waddey, *M. of M*......Alexandria, Va.
J. T Nalls, *M. C. B*. ...... .Alexandria, Va.
Richmond & Petersburg R.R. 4-8½ g. 25 m. 8 lo. 132 c.
J. R. Kenly, *Supt*..... ....Richmond, Va.
John O'Brien, *M. M*.............Richmond, Va.
Rio Grande R. R. 3-6 g. 22 m. 3 lo. 40 cars.
M. J. Gomila, *Rec. & Gen. Man* Brownsville, Tex.
G. W. Rendall, *M. M*......... Brownsville, Tex.
M. Markwood, *M C. B*... .. .Brownsville, Tex.
Rio Grande & Pecos Ry. 4-8½ g. 27 m. In progress.
W. W. Hungerford, *Man*..........Laredo, Tex.
Rochester & Lake Ontario Ry. 4-8½ g. 6 m. 2 lo. 10 c.
N. B. Ellison, *Man* .. ..Rochester, N. Y.
Rochester & Pittsb'g R. R. 4-8½ g. 260 m. 60 lo. 3,146 c.
Geo. E. Merchant, *Gen. Man*...Rochester N. Y.
J. T. Gardiner, *Gen. Supt* ....Buffalo, N. Y.
C. W. Mills, *M. M*...... .. ...Rochester, N. Y.
Rock Island & Mercer County R. R., and
Rock I'd & Peoria Ry. 4-8½ g. 113 m. 13 lo. 357 c.
R. R. Cable, *V.-P. & Gen. Supt*..Rock Island, Ill.
R. I. & P. Ry.: H. B. Sudlow, *Supt. & P. A.* do.
Joseph Elder, *M. M*..................Peoria, Ill.
R. I. & M. C. Rd.: B. T. Cable, *Supt*. R'k Island, Ill.
J. H. Parks, *M. M*............. .Rock Island, Ill.
Rogersville & Jefferson R. R. 5 g. 16 m. 1 lo. 6 cars.
C. M. Leuty, *Supt*........ Rogersville, Tenn.
Rome (Ga.) R. R. 5 g. 20 m. 2 lo. 17 cars.
Eben Hillyer, *Supt*........... ..... Rome, Ga.
O. W. Harbin, *M. M. & C. B*......... Rome, Ga.
Rome, Watertown & Ogdensburg R. R.
4-8½ g. 417 m. 61 lo. 1,831 cars.
H. M. Britton, *Gen. Man. & P. A.* Oswego, N. Y.
Geo. H. Haselton, *S. M. P. & M*..Oswego, N. Y.
E'n Div.: J. D. Remington, *A. Supt*. Watertown, N.Y.
W'n Div.: W. H. Chauncey, *A. Supt*. Oswego, N. Y.
Roodhouse & Scottsville Ry. In progress.
Geo. P. Merrill, *Gen. Man*..........Chicago, Ill.
Ruby Hill R. R. (*See Eureka & Pal.*)
Rumford Falls & Buckfield R.R. 4-8½ g. 29 m. 2 l. 62 c.
L. L. Lincoln, *Supt. & Pur. Agt*...Canton, Me.

S

Sabine & East Texas Ry. (*See Cen. Pac.*)
Sacramento & Placerville R. R. (*See Cen. Pac.*)
Saginaw Bay & Northw'n R. R. 4-8½ g. 31 m. 6 lo. 136 c.
J. Jackson, *Gen. Man*.... ...Pinconning, Mich.
F. T. Liliote, *Act. Pur. Agt*...Pinconning, Mich.
Edward Keeler, *M. M*........Pinconning, Mich.
Saginaw, Tuscola & Huron R. R.
3 g. 50 m. 3 lo. 83 cars.
M. B. Wilkinson, *Gen. Supt*..E. Saginaw, Mich.
Saginaw Valley & St. Louis R. R. 4-8½ g. 39 m. 4 l. 64 c
N. W. Merrill, *Supt* ....Saginaw, Mich.
Allan Bourn, *Pur. Agt*.. ....Detroit, Mich.
Geo. C. Watrous, *M. M*.... ....Iona, Mich.
Salisbury R. R. 4-8½ g. 11 m. 1 lo. 1 car.
R. J. Batzer, *Supt*..............Pittsburgh, Pa.
Salt Lake & Western R. R. (*See Un. Pac.; (6) Div.*)
San Francisco & No. Pac. 4-8½ g. 139 m. 11 lo. 245 c.
Arthur Hughes, *Gen. Man*..San Francisco, Cal.
H. C. Whiting, *Supt*.... ....Petaluma, Cal.
Ed. Reynolds, *Gen. M. M*.........Donahue, Cal.
Ed. Reynolds, *M. C. B*.......... Donahue, Cal.
Sanborn, Cooperstown & Turtle M. R. R. In progress.
C. A. Roberts, *Gen. Man*. .. .. Sanborn, Dak.
Sandy River R. R. 2 g. 18 m. 3 lo. 36 cars.
N. B. Beal, *Pres. & Supt* ....Phillips, Me.
M. Saunders, *M. M. & C. B*...... ..Phillips, Me.
Sandusky, Mansfield & Newark R. R. (*See B. & O.*)
Sanford & Indian River R. R. (*See So. Flor.*)
San Luis Obispo & Santa Maria R. R.
3 g. 20 m. 2 lo. 30 cars.
Charles Goodall, *Man*......San Francisco, Cal.
San Pete Valley R. R. 3 g. 33 m. 2 lo. 57 cars.
F. C. Hand, *Supt*.. ....Wales, U. T.
J. E. Bamberger, *Pur. Agt*.... Salt Lake, U. T.
B. Bates, *M. M*.....................Wales, U. T.
Santa Cruz R R. (*See So. Pac.; Nor'n Div.*)
Saratoga, Mt. McGregor & Lake George R. R.
3 g. 11 m. 3 lo. 12 cars.
John McGee, *Supt*. ....Saratoga Springs, N. Y.
Savannah, Florida & W'n Ry. 5 g. 425 m. 50 lo. 736 c.
H. S. Haines, *Gen. Man*........Savannah, Ga.
R. G. Fleming, *Supt*.... ....Savannah, Ga.
F. S. Pendergast, *Ch. Eng*........Savannah, Ga.
A. A. Aveilhé, *Pur. Agt*..........Savannah, Ga.
G. M. D. Riley, *M. of Mach*......Savannah, Ga.
E. Giffken, *For. Car Dept*. .....Savannah, Ga.
Sav., Griffin & No. Ala. R. R. *Op. by Central (Ga.)*.
Schuylkill & Lehigh R. R. (*See Phil. & Read.*)
Scoharie Valley R. R. (*See Middleburg & Sch.*)
Scioto Valley R. R. 4-8¾ g. 132 m. 17 lo. 548 cars.
Geo. Skinner, *Supt. & P. A t*.....Columbus, O.
R. Bromley, *M. M*. . ...Portsmouth, O.
Seaboard & Roanoke R. R. 4-8½ g. 80 m. 21 lo. 384 c.
E. G. Ghio, *Mast. of Trans*....Portsmouth, Va.
J. A. Walton, *Pur. Agt*.........Portsmouth, Va.
M. M. Pendleton, *S. M. P. & M*. Portsmouth, Va.
Sedalia, Warsaw & Southern Ry. (*See Mo. Pac.*)
Sharpsville R. R. 4-8½ g. 23 m. 3 lo. 13 cars.
Walter Pierce, *Gen. Man*......Sharpsville, Pa.
Shenandoah Valley R. R. 4-9 g. 249 m. 32 lo. 849 c.
Norfolk & Western R. R. 5 g. 486 m. 82 lo. 1,779 c.
J. H. Sands, *Gen. Supt* .... .Roanoke, Va.
W. C. De Armond, *Pur. Agt*. ..Philadelphia, Pa.
Chas. Blackwell, *Supt. of M. P*...Roanoke, Va.
W. A. Morgan, *M. C. B*..........Lynchburg, Va.
Sh. Val. Rd.: D. W. Flickwir, *Supt*., Roanoke, Va.
N. & W.; W. Div.: Frank Huger, *Supt*.; and
N. & W.; E. Div.: N. M. Osborne, *Supt*.; and
J. T. Robinett, *M. M*. . ..... Petersburg, Va.
Shenango & Allegheny R.R 4-9½ g. 57 m. 8 lo. 248 c.
J. T. Blair, *G. Man. & Pur. Agt*. Greenville, Pa.
Edw. Richardson, *M. M. & C. B*. Greenville, Pa.
Shepaug R. R. 4-8½ g. 38 m. 3 lo. 28 cars.
Edwin McNeill, *Supt*..............Litchfield, Ct.
F. J. Broughet, *M. M*........... Litchfield, Ct.
Ship Is., Ripley & Ky. R. R. 3 g. 25 m. 2 lo. 23 cars.
C. L. Harris, *Supt. & Pur. Agt*....Ripley, Miss.
W. H. Phelps, *M. M*.................Ripley, Miss.
Silver City, Deming & Pacific R. R. 3 g. 47 m. 3 l. 141 c.
John W. Smith, *Gen. Supt*....Silver City, N. M.
Silver Lake Ry. 4-8½ g. 6 m. 1 lo. 4 cars.

S. L. Chapin, *Supt*................ ..Perry, N. Y.
Sinaloa & Durango R. R. 4-8½ g. 38 m. 2 lo. 40 cars.
Geo. S. Skilton, *Supt*......Altata, Sinaloa, Mex.
John E. Bell, *M. M*...............Culiacan, Mex.
Skaneateles R. R. 4-8½ g. 5 m. 2 lo. 5 cars.
J. McNamara, *Supt*........Skaneateles, N. Y.
Sioux City & Pacific R. R. 4-8½ g. 427 m. 28 lo. 785 c.
P. E. Hall, *Gen. Man. & P. A.* Cedar Rapids, Ia.
C. M. Lawler, *Gen. Supt*....Missouri Valley, Ia.
R. W. Hamer, *Pur. Agt*.. ....Chicago, Ill.
W. G. Brownson, *Asst. Supt*.... .Norfolk, Neb.
S. A. Teal, *M. M*....... ....Missouri Valley, Ia.
W. H. Ramseyer, *M. C. B*. ..Missouri Valley, Ia.
Smyrna & Delaware Bay R. R. (*See Kent County.*)
Sodus Bay & Southern Ry. 4-8½ g. 34 m. 4 lo. 40 c.
G. H. Stearns, *Gen. Man*. ..Sodus Point, N. Y.
G. H Stearns, *Supt. & Pur. Agt*. Sodus Point, N.Y.
F. H. Garlock, *M. M*........Sodus Point, N. Y
C. H. Hill, *M. C. B* ....Sodus Point, N. Y.
Somerset R. R. 4-8½ g. 25 m. 3 lo. 24 cars.
W. M. Ayer, *Supt & Pur. Agt*......Oakland, Me.
S. P. Mosher, *For. Car Rep*....No. Anson, Me
C. Crowell, *For. Lo. Rep's*.....No. Anson, Me.
Somerset & Cambria R. R. (*See B. & O.*
Sonora Ry. (*See A., T. & S. Fe.*)
South & North Alabama R. R. (*See Louis. & Nash.*)
South Carolina Ry. 5 g. 246 m. 46 lo. 834 cars
John B. Peck, *Gen. Man*. ......Charleston, S. C
S. B. Pickens, *Pur. Agt*........Charleston, S. C.
P. J. Cochrane, *Mast. of Mach*. Charleston, S. C.
Geo. H. Gramling, *M. C. B*....Charleston, S. C.
South-Eastern Ry. 4-8½ g. 280 m. 30 lo. 1,000 cars.
T. A. McKinnon, *Gen. Man*.....Montreal, Can.
A. G. Eastman, *M. M*..........Farnham, P. Q.
South Florida R. R. 3 gauge 115 m. 13 lo. 250 cars.
B. R. Swoope, *Supt. & P. A*.......Sanford, Fla.
R. Derby, *M. M*............ ......Sanford, Fla.
A. D. Stentiford, *M. C. B*..........Sanford, Fla.
South Mountain R. R. 4-8½ g. 18 m. 4 lo. 22 c.
W. H. Woodward, *Supt*. Pine G've Furnace, Pa.
South Pacific Coast R. R. 3 g. 81 m. 16 lo. 500 cars
M. Fillmore, *Supt*.... ....San Francisco, Cal.
G. H. Waggoner, *Pur. Agt*..San Francisco, Cal.
D. E. Arnold, *M. M. & C. B* ....Newark, Cal.
South-Western R. R. (Ga.) (*See Central of Ga.*)
South-Western Ry. (Ky.) 4-8½ g. 4 m. 1 lo. 38 cars.
J. M. Wilson, *Supt*............Harrodsburg, Ky.
J. Tomlinson, *Pur. Agt*......Harrodsburg, Ky.
Southern Central R. R. 4-8½ g. 156 m. 21 lo. 467 c.
James G. Knapp, *Gen. Supt. & P. A.* Auburn, N.Y
John White, *M. M*... ....Auburn, N. Y.
H. Mooney, *M. C. B*..............Auburn, N. Y.
Southern Kansas Ry. (*See At., Top. & Santa Fe.*)
Southern Maryland R. R. 4-8½ g. 20 m. 1 lo. 20 c.
Robert Knight, *Supt*. ....Brandywine, Md.
C. R. Joyce, *M. M*......... ...Brandywine, Md.
Southern Pacific R. R. 4-8½ g. 198 m. 30 lo. 728 c.
Northern Div. (*For other Divs. see Cen. Pac.*)
A. C. Bassett, *Supt*. ......San Francisco, Cal
J. R. Watson, *Pur. Agt*.....Sacramento, Cal.
J. T. Wilson, *M. M*..... ..San Francisco, Cal.
F. N. Bellisle, *M. C. B*. ...San Francisco, Cal.
Southern Pacific R. R. of Arizona. (*See Cen. Pac.*)
Southern Pacific R. R. of New Mexico. (*See Cen. Pac.*)
Spartanburg, Union & Columbia R. R.
(*See Rich. & Dan.; (3) Div.*
Spring Brook R. R. 4-3 g. 8 m. 1 lo. 18 cars.
Charles Pugh, *Pres*......... ... ..Pittston, Pa.
Spring Hill & Parrsboro Ry. (*See Cumberland.*)
Springfield, Effingham & So.-E'n Ry. (*See Ind. & Ill.*)
Springville & Sardinia Ry. 4-8½ g. 12 m. 1 lo. 8 c.
Bertrand Chaffee, *Pres*.... ..Springville, N. Y.
St. Croix & Penobscot R. R. 4-8½ g. 22 m. 4 lo. 195 c.
S. W. Haycock, *Supt. & Pur. Agt*. .Calais, Me.
G. H. Corsen, *M. M*....... .... ..Milltown, Me.
H. C. Tincker, *M. C. B*............Milltown, Me.
St. John & Maine Ry. (*See New Brunswick.*)
St. John's Ry. 4-8½ g. 14½ m. 2 lo. 24 cars.
R. McLaughlin, *Pr. & Supt*. .Jacksonville, Fla.
Geo. Ferro, *M. of Mach*.. ....Tocoi, Fla.
St. John's & Lake Eustis Ry. 3 g. 36 m.
W. J. Jarvis, *Supt*.............. Ft. Mason, Fla.
St. Johnsb'ry & Lake Champ. 4-8½ g. 120 m 10 lo. 372 c.
A. B. Jewett, *Supt. & P. A*..St. Johnsbury, Vt.
Geo. E. Howe, *M. M. & C. B*. St. Johnsbury, Vt.
St. Joseph Valley R. R. 3 g. 15 m. 1 lo. 11 cars.
E. T. Chase, *Gen. Man*. .Berrien Springs, Mich.
St. Joseph & Des Loge Ry. 3 g. 13 m. 4 lo. 70 cars.
T. T. Onderdonk, *Supt*..... Bonne Terre, Mo.
St. Joseph & Western R. R. (*See Union Pac.; (1) Div.*)
St. Joseph & Des Moines R. R. (*See K. C., St. J. & C. B.*)
St. Lawrence & Ottawa Ry. (*See Can. Pac.*)
St. Louis, Alton & Terre Haute R. R.
Main Line. (*See C., C., C. & I.; Ind. & St. L. Div.*
St. Louis & Cairo Div.: 4-8½ g 137 m. 17 lo. 800 c
G. W. Parker, *Gen. Man* ....St. Louis, Mo.
J. L. Hinckley, *Supt*... ... .Belleville, Ill.
A. M. De Clerq, *M. M*.......... St. Louis, Mo
St. Louis Bridge Co. and Tunnel R. R.
4-8½ g. 31 m. 22 lo. 11 cars.
Wm. Taussig, *Gen. Man*..........St. Louis, Mo
A. W. Dickinson, *Supt*.... .... St. Louis, Mo.
J. E. Williams, Jr., *Pur. Agt*.... St. Louis, Mo
H. M. Smith, *M. M*...............St. Louis, Mo.
St. Louis Coal R. R. 4-8½ g. 93 m. 10 lo. 217 cars.
Jas. Prentice, *Supt*.............Carbondale, Ill.
Jas. C. Bryden, *Pur. Agt*... ....St. Louis, Mo.
St. Louis, Des Moines & Northern Ry. 4-8½ g. 43 m.
C. F. Merk, *Supt*..............Des Moines, Ia.
St. L., Ft. Scott & Wichita R.R. 4-8½ g. 160 m. 6 l. 337 c.
J. W. Miller, *V. P. & Gen. Man*..Fort Scott, Kan.
Tho. N. Lewis, *Asst. Supt*......Fort Scott, Kan.
Tho. N. Lewis, *Pur. Agt*.... ..Fort Scott, Kan.
Henry Berger, *M. M* ....Ft. Scott, Kan.
A. A. Liddell, *M. C. B*......... ..Ft. Scott, Kan.
St. L., Hannibal & Keokuk. 4-8½ g. 85 m. 5 lo. 70 c.
W. W. Walker, *Gen. Supt*....... Hannibal, Mo.
Geo. Douglass, *Pur. Agt*.........Hannibal, Mo.
St. Louis, Iron Mt. & So'n Ry. (*See Mo. Pac.; (4) Div.*)
St. L., Keokuk & No.-W'n. Ry. (*See C., B. & Q.*)
St. L., Salem & Little Rock. 4-9 g. 72 m. 5 lo. 111 c.
H. A. Crawford, *V. Pr. & P. A*...St. Louis, Mo.
E. B. Sankey, *Supt*...................Salem, Mo.
Thomas Everson, *M. M*. ....Steelville, Mo
J. W. Houston, *M. C. B*............Steelville, Mo.
St. Louis & Cairo R. R. 3 g. 152 m. 22 lo. 896 cars.
Chas. Hamilton, *Gen. Supt*..... .St. Louis, Mo.
R. M. Pringle, *M. M*..............St. Louis, Mo.
St. L. & San Fran. Ry. 4-8½ g. 902 m. 88 lo. 3,000 c.
C. W. Rogers, *V. P. & Gen. Man*. St. Louis, Mo.
D. H. Nichols, *Mast. Tran*..No. Springfield, Mo.
A. G. Thompson, *Pur. Agt*.......St. Louis, Mo.
M. Kearney, *M. M. & C. B*..No. Springfield, Mo.
East Div.: A. Veech, *Supt*...... ..St. Louis, Mo.
Central Div.: W. A. Thoms, *Supt*..Springfield, Mo.
Kan. Div.: J. R. Wentworth, *Supt*. Neodesha, Kan.
St. Martin's & Upham Ry. 4-8½ g. 30 m. 2 lo. 8 cars.
A. E. Killam, *Manager*........St. Martin's, N. B.
St. Paul, Minneapolis & Manitoba Ry.
4-8½ g. 1,402 m. 201 lo. 5,068 cars.
A. Manvel, *Gen. Man*............St. Paul, Minn.
E. B. Wakeman, *Asst. Gen. Supt*. St. Paul, Minn.
J. C. Morrison, *Pur. Agt*......... St. Paul, Minn.
H. Middleton, *M. M. & C. B* ... St. Paul, Minn.
Breck. Div.: W. S. Kemp, *Supt*... St. Paul, Minn.
F. F. Div.: J. B. Rice, *Supt*........St. Paul, Minn.
No'n Div.: A. Guthrie, *Supt*.....Crookston, Minn.
St. Paul & Duluth R. R. 4-8½ g. 225 m. 37 lo. 1,080 c.
W. H. Fisher, *Gen. Supt*..... ..St. Paul, Minn.
J. G. Callahan, *Pur. Agt*........St. Paul, Minn.
W. McFarland, *M. M*............St. Paul, Minn.
John Hill, *M. C. B*. ....St. Paul, Minn.
State Line & Sullivan R. R. 4-8½ g. 25 m. 3 lo. 263 c.
I. O. Blight, *Supt*.................Towanda, Pa.
Staten Island R. R. 4-8½ g. 13 m. 4 lo. 18 c.
J. W. Wilbur, *Supt*........... New York, N. Y.
Stony Clove & Catskill Mountain R. R.
3 g. 14 m. 2 lo. 22 cars.
Geo. Coykendall, *Gen. Supt*....Rondout, N. Y
Stony Creek R. R. 4-8½ g. 11 m
Geo. B. Boggs, *Supt* .... Norristown, Pa.
Sterling Mountain Ry. 6 g. 8 m. 2 lo. 145 cars.
J. C. Missimer, *Supt*..........Sloatsburg, N. Y.
Suffolk Lumber R. R. 3 g. 15 m. 3 lo. 41 cars.
W. M. Whaley, *Supt*.. ....Suffolk, Va.
Summit Branch R. R. 4-9 g. 20 m. 7 lo. 10 cars.
Thomas Gucker, *Supt* ....Williamsport, Pa.
Susquehanna & Delaware River R. R. In progress.
D. Y. Kilgore, *Pres*............Philadelphia, Pa.
Sussex R. R. (*See Del., Lack. & West.*)

Syracuse, Binghamton & N. Y. R. R. (*See D. L. & W.*)
Syr., Ontario & N. Y. R. R. (*See N. Y., W. Sh. & Buf.*)
Syracuse, Geneva & Corning; Corning, Cowanasque & Antrim R. Rs. 4–8½ g. 142 m. 28 lo. 1,044 c.
A. H. Gorton, *Supt* .... Corning, N. Y.
W. E. Gorton, *Asst. Supt* .... Corning, N. Y.
Andrew Beers, *Pur. Agt* .... Corning, N. Y.
O. C. Patchell, *M. M* .... Corning, N. Y.
C. J. Butler, *M. C. B* .... Corning, N. Y.

T

Tennessee Coal R. R. 5 g. 28 m. 8 lo. 204 cars.
A. M. Shook, *Gen. Man* ...... Tracy City, Tenn.
W. A. Knight, *M. M* .... Tracy City, Tenn.
Tennessee & Sequatchee Valley R. R. 3 g. 42 m. 1 lo. 24 cars.
Chas. Clinton, *Gen. Supt* .... Spring City, Tenn.
P. V. Mooney, *Pur. Agt* ..... Spring City, Tenn.
Terre Haute & Indianapolis R. R. 4–9 g. 398 m. 105 lo. 4,170 cars.
Joseph Hill, *Gen. Supt* .... St. Louis, Mo.
C. R. Peddle, *P. Agt* .... Terre Haute, Ind.
Geo. H. Prescott, *S. M. P. & M.* Terre Haute, Ind.
F. C. Cleaver, *M. M* .... Terre Haute, Ind
E. D. Carter, *M. C. B* ...... Terre Haute, Ind.
Chas. Butler, *M. M* .... Effingham, Ill.
Clinton Idler, *Foreman* ... Indianapolis, Ind.
Terre Haute & So.-Eastern Ry. 4–9 g. 44 m. 2 lo. 145 c.
Geo. Atherton, *Supt* .... Terre Haute, Ind.
Texas-Mexican Ry. (*See Mex. Nat.*.
Texas Trunk R. R. 4–8½ g. 36 m. 2 lo. 8 cars.
Hugh Irwin, *Gen. Supt* .... Dallas, Tex.
Texas Western Ry. 3 g. 52 m. 2 lo. 44 cars.
Henry Hatch, *Gen. Man* .... Houston, Tex.
T. F. Glispin, *M. M* .... Houston, Tex.
Texas & N. O. R. R. (*See Cen. Pac.; G. H. & S. A. Div.*)
Texas & Pacific. (*See Mo. Pac. Ry.; (6) Div.*)
Texas & St. Louis Ry. 3 g. 769 m. 84 lo. 2,000 cars.
W. R. Woodard, *Rec* .... St. Louis, Mo.
J. J. Frey, *Gen. Supt* .... St. Louis, Mo.
C. S. Brooks, *Pur. Agt* .... St. Louis, Mo.
S. M. P. & M ... St. Louis, Mo.
Tex. Div.: J. T. Gerry, *Supt.* .... Tyler, Tex.
P. J. Milan, *M. M* .... Tyler, Tex.
Tionesta Valley R. R. 3 g. 15 m
George Dickinson, *Gen. Supt* .... Sheffield, Pa.
Tioga R. R 4–8½ and 6 g. 67 m. 18 lo. 960 cars.
R. Dupuy, *Supt* .... Blossburg, Pa.
J. C. Guthrie, *Pur. Agt* ...... New York, N. Y.
Pere Bonny, *M. M* .... Blossburg, Pa.
D. H. Stratton, *M. C. B* .... Blossburg, Pa.
Toledo, Ann Ar. & No. Mich. Ry. 4–8½ g. 63 m. 9 lo. 186 c.
J. M. Ashley, *Gen. Man* ...... Ann Arbor, Mich.
H. W. Ashley, *Supt. & Pur. Agt.* do
C. C. Dodge, *M. M* .... Ann Arbor, Mich.
Toledo, Cin. & St. Louis R. R. 3 g. 798 m. 101 lo. 3,500 c.
E. P. Murray, *Gen. Supt* .... Toledo, O.
F. W. Stewart, *P. Agt* .... Toledo, O.
L. W. James, *Supt. Mach* .... Delphos, O.
Toledo Div.: W. H. Vandergrift, *Supt.*; do
Thos. Robertson, *M. M* .... Delphos, O.
J. S. Wiers, *For. Car Rep* .... Delphos, O.
Del. & Cin. Divs.: C. A. Bell, *Supt* .... Cin., O.
T. J. Hamer, *M. M* .... Cincinnati, O.
So.-Ea. Div. and Dayton Div.:
C. E. Henderson, *Gen. Man* ...... Dayton, O.
W. H. Anderson, *M. M* .... Dayton, O.
St. Louis Div.: Frank F. Allen .... Charleston, Ill.
P. H. Murphy, *M. M* .... Charleston, Ill.
Ironton Div.: C. C. Clark, *Supt* ..... Ironton, O.
Dayton Div.: J. E. Gimperling, *Supt* .. Dayton, O.
Toledo & Indianapolis R. R. 4-8½ g. 43 m. 4 lo. 118 c.
M. Clark, *Supt* .... Toledo, O.
H. M. Swan, *M. M.* .... Toledo, O.
Toledo & South Haven R. R. (*See Paw Paw.*)
Tonawanda Val. & Cuba R. R. (*See Brad., B. & K.*)
Toronto, Grey & Bruce Ry. 4–8½ g. 191 m. 28 l. 446 c.
Edmund Wragge, *Gen. Man* ... Toronto, Can.
W. Watson, *Pur. Agt* .... Toronto, Can.
David Preston, *M. M* .... Toronto, Can.
Toronto & Nipissing Ry. (*See Mid. Ry. of Can.*)
Troy & Boston R. R. 4–8½ g. 48 m. 20 lo. 484 cars.
D. Robinson, *Pres. & Pur. Agt* ...... Troy, N. Y.
Joseph Crandell, *Supt* .... Troy, N. Y.
Z. B. Davis, *M. M* .... Troy, N. Y.
A. Brewer, *M. C. B* .... Troy, N. Y.
Troy & Greenfield R. R. & H. Tunnel. 4–8½ g. 44 m.
A. W. Locke, *Man* .... North Adams, Mass.
Tuckerton R. R. 4–9 g. 31 m. 2 lo. 29 cars.
J. J. Pharo, *Supt. & Pur. Agt.* Tuckerton, N. J.

U

Ulster & Delaware R. R. 4–8½ g. 74 m. 10 lo. 214 cars.
Jas. H. Jones, *Supt* .... Rondout, N. Y.
Joseph Rush, *M. M* .... Rondout, N. Y.
John H. Decker, *M. C. B* .... Rondout, N. Y.
Union Pacific Ry. (7 Gen. Divs.) 3 & 4–8½ g. 4,633 m. 510 lo. 10,550 cars.
S. R. Callaway, *Gen. Man* .... Omaha, Neb.
Thos. L. Kimball, *Asst. Gen Man.* Omaha, Neb.
M. H. Goble, *Pur. Agt* .... Omaha, Neb.
I. H. Congdon, *S. M. P. & C. D* ... Omaha, Neb
John Wilson, *Asst. do* .... Omaha, Neb.
(1) Neb. Div.: P. J. Nichols, *Gen. Supt* .. Omaha, Neb.
E. Div.: C. B. Havens, *Supt* ...... Omaha, N. B.
R. McConnell, *M. M* .... Omaha, Neb.
A. M. Collett, *M. C. B* .... Omaha, Neb.
E. Sleppy, *M. M* .... G. Island, Neb.
L. Pole Div.: W. A. Deuel, *Supt* .. Cheyenne, W. T
J. H. McConnell, *M. M.* .... N. Platte, Neb.
R. McDougall, *M. M* .... Cheyenne, W. T.
(2) Wy. Div.: E. Dickenson, *Gen. Supt* .. Laramie, W. T.
T. E. Lewis, *M. M* .... Laramie, W. T.
T. A. Davis, *M. M* .... Rawlins, W. T.
Wes. Div.: C. E. Wurtelle, *Supt.* Evanston, W. T.
Geo. F. Chapman, *M. M* ...... Evanston, W. T.
(3) Idaho Div.: W. B. Doddridge, *Gen. Supt.* Ogden, U.
F. Rearden, *M. M* .... Pocatello, Id.
Ogden Short Line Div.:
R. Blickensderfer, *Supt* .... Pocatello, Id.
Utah & Northern Div.:
W. P. P. St. Clair, *Supt* ...... Eagle Rock, Id.
W. J. Hemphill, *M. M* .... Eagle Rock, Id.
W. J. Hemphill, *M. M* .... Eagle Rock, Id.
J. W. Paul, *Gen. For. C. D* .. Eagle Rock, Id.
(4) Col. Cent. Div.: A. A. Egbert, *Gen. Supt.* Denver, Col.
F. Meirtsheimer, *M. M* .... Denver, Col.
C. C. Div.: P. Touhy, *Supt* .... Denver, Col.
So. Park Div.: D. K. Sweet, *A. Supt* .. Como, Col.
(5) Kan. Div.: S. T. Smith, *G. Supt.* Kansas City, Mo.
K. Pac. Div.: J. O. Brinkerhoff, *Supt.* Kan. C'y, Mo.
J. O. Chapman, *M. M* ...... Armstrong, Kan.
T. B. Roberts, *M. C. B* ...... Armstrong, Kan.
Kansas Central Div.:
W. T. Kelley, *Supt* .... Leavenworth, Kan.
Smoky Hill Div.:
O. H. Dorance, *Supt* .... Wallace, Kan.
J. B. Dailey, *M. M* .... Ellis, Kan.
(6) Salt Lake & Western Div.:
W. W. Ritter, *Supt* ...... Salt Lake City, Utah.
(7) Nevada Central Ry. 3 g. 93 m. 4 lo. 78 cars.
F. W. Dunn, *Gen. Supt. & P. A.* Battle Mt., Nev.
Z. T. Sprigg, *M. M* .... Battle Mountain, Nev.
United States Rolling Stock Co. 19 lo. 4,692 cars.
A. Hegewisch, *Pres* .... New York, N. Y.
W. H. Chaddock, *Gen. Agt* .... Chicago, Ill.
Upson County R. R. (*See Central of Ga.*)
Utah Central Ry. 4–8½ g. 280 m. 21 lo. 358 cars.
John Sharp, *Gen. Supt* ... Salt Lake City, Utah.
S. H. Hill, *Pur. Agt* .... Salt Lake City, Utah.
Geo. G. Bywater, *M. M* .. Salt Lake City, Utah
Peter Reid, *M. C. B* .... Salt Lake City, Utah
Utah & Nevada Ry. 3 g. 37 m. 3 lo. 33 cars
W. W. Ritter, *Gen. Man* ... Salt Lake City, Utah.
Robert Anderson, *M. M* .. Salt Lake City, Utah.
Utah & Northern Ry. (*See Union Pac.; (3) Div.*)
Utah & Pleasant Valley Ry. (*See Den. & Rio. Gr.*)
Utica, Ithaca & Elmira Ry. 4–8½ g. 120 m. 11 lo. 152 c.
Geo. S. Sadler, *Supt* .... Elmira, N. Y.
Edw. Mahler, *Pur. Agt* .... Elmira, N. Y.
C. J. Howe, *M. M. & M. C. B* .. Breesport, N. Y.
Utica, & Black Riv. R. R. 4–8½ g. 180 m. 22 lo. 452 c.
J. F. Maynard, *Gen. Supt. & P. A.* Utica, N. Y.
John Bailey, *M. M* .... Utica, N. Y.
David James, *M. C. B* .... Utica, N. Y.

V

Vaca Vall. & Clear Lake R. R. 4–8½ g. 30 m. 2 lo. 19 c.
G. B. Stevenson, *Gen. Supt* ...... Vacaville, Cal.
Valley Ry. (Ohio) 4–8¾ g. 85 m. 15 lo. 581 cars
Isaac Reynolds, *Supt. & P. Agt.* Cleveland, O.
Chas. Blanchard, *M. C. B* .... Cleveland, O.
Valley R. R. Va. 4 8½ g. 62 m
S. Spencer, *Pres* .... Baltimore, Md.
Vermont Valley R. R. (*See Conn. River.*)
Vicksburg & Brunswick R. R. (*See Cen. of Ga.*)
Vicksburg & Meridian R. R. (*See Cin., N. O. & Tex. Pac.*)
Vicks. Shreveport & Pac. R. R. (*See C., N. O. & T. P.*)
Victoria Ry. (*See Midland Ry. of Can.*)
Virginia Midland Ry. (*See Rich. & Dan.; (4) Div.*)
Virginia & Truckee R. R. 4–8½ g. 54 m. 17 lo. 375 c.
Carson & Colorado R. R. 3 g. 294 m. 6 lo. 134 c.
H. M. Yerington, *Gen. Supt* ...... Carson, Nev.
R. J. Laws, *Supt.* (C. & Col.) .. Hawthorne, Nev.
Hume Yerington, *Pur. Agt* .... Carson, Nev.
I. N. Fording, *M. M* .... Carson, Nev.
M. M. Hyde, *M. C. B* .... Carson, Nev.

W

Wabash, Chester & W'n R. R. (*See St. Louis Coal.*)
Wabash, St. Louis & Pacific Ry. (4 Gen. Divs., 4–8½ g. 3,241 m. 598 lo. 17,230 cars.
A. L. Hopkins, *2d V. P* .... St. Louis, Mo.
A. A. Talmage, *Gen. Man* ...... St. Louis, Mo.
R. B. Lyle, *Pur. Agt* .... St. Louis, Mo.
Jacob Johann, *Gen. M. M* ...... Springfield, Ill.
U. H. Kohler, *Gen. M. C. B* .... Toledo, O.
(1) Eas'n Div.: G. W. Stevens, *Supt* .... Peru, Ind.
J. B. Barnes, *M. M* .... Fort Wayne, Ind.
John McKenna, *M. M* .... Peru, Ind.
Cairo Div.: *M. M* ...... Carmi, Ill.
Rant'l Div.: B. F. Mathias, *Asst. Supt.* Rantoul, Ill
J. McCarthy, *M. M* .... Rantoul, Ill
(2) Middle Div.: H. F. Clark, *Supt* .... Springfield, Ill.
B. B. Rose, *M. C. B* .... Decatur, Ill.
G. A. Hurd, *Asst. Supt* .... Forest, Ill.
(3) Northern Div.: E. N. Armstrong, *Supt.* Decatur, Ill.
R. M. Hemphill, *M. C. B* .... Peoria, Ill.
E. B. Hyde, *Asst. Supt* .... Havana, Ill.
(4) Western Div.: R. S. Miner, *Supt.* ... Moberly, Mo
W. H. Selby, *M. M* .... Moberly, Mo.
C. S. Buck, *M. C. B* .... Moberly, Mo.
E. Dresser, *Asst. Supt* .... Stanberry, Mo
D. Moin. Div.: C. F. Meek, *A. Supt.* Des Moines, Ia
Walden's Bridge R. R. 3 g. 23 m. 3 lo. 37 cars.
John G. Scott, *Gen Man* .... Jenks P. O., Tenn.
Wallkill Valley.
J. E. Childs, *Gen. Supt* .... New York, N. Y.
Geo. H. Graves, *Supt* .... Kingston, N. Y.
E. Minshull, *M. M* .... Middletown, N. Y.
I. W. Fowler, *Pur. Agt* .... Middletown, N. Y.
Walla Walla & Columbia Riv. R. R. (*See Ore. Ry.*)
Walton R. R. 5 g. 10 m. 1 lo. 7 cars.
D. H. Walker, *Pres* .... Monroe, Ga.
Warren & Farnsworth Valley R. R. 3 g. 11 m. 3 lo. 39 cars.
A. D. Wood, *Supt* .... Warren, Pa.
Warwick Valley R. R. (*See Leh. & Hud. River.*)
Wasatch & Jordan Valley R. R. (*See Den. & Rio. Gr.*)
Washington, Ohio & West. R. R. 4–8½ g. 52 m. 5 lo. 87 c.
S. M. Brophy, *Supt* .... Alexandria, Va.
W. Mountjoy, *Act. For* .... Alexandria, Va.
John Harrison, *M. C. B* .... Alexandria, Va.
Waynesburg & Washington Rd. 3 g. 29 m. 3 lo. 26 c.
C. E. Bower, *Supt* .... Waynesburg, Pa.
A. M. Kline, *M. C. B* .... Waynesburg, Pa.
Welland Ry. 4–8½ g. 25 m. 4 lo. 147 cars.
William Pay, *Supt* .... St. Catharines, Ont.
Jas. Taylor, *M. M* .... St. Catharines, Ont.
Wm. H. Pay, *M. C. B* ...... St. Catharines, Ont.
West End Narrow Gauge Ry. 3 g. 16 m. 3 lo. 13 c.
Rolla Wells, *Supt* .... St. Louis, Mo.
M. M. Hodgman, *M. M* .... Florissant, Mo
West Feliciana R. R. 4–8½ g. 27 m. 2 lo. 22 cars
J. B. McGehee, *Pr. & Gen. Supt.* Bayou Sara, La.
J. A. Tilton, *M. M. & C. B* ..... Bayou Sara, La.
W. Va., Central & Pittsb'g Ry. 4-8½ g. 50 m. 4 lo. 119 c.
T. B. Davis, *Gen. Man* .... Piedmont, W. Va.
W. E. Porter, *Gen. Supt* ...... Piedmont, W. Va
Geo. W. Harrison, *Pur. Agt* ... Piedmont, W. Va.
E. W. Lippencott, *M. M* .... Piedmont, W. Va.
West & East R. R. (*See Ill. Cen.; N. O. Div.*)
West Jersey R. R. (*See Penn. R. R.; (3) Div.*)
Western R. R. (of Ala.) 5 g. 85 m. 15 lo. 270 cars.
Atlanta & W. Point Rd. 5 g. 87 m. 14 lo. 240 c.
Cecil Gabbett, *Gen. Man. & Supt* .. Mont., Ala.
C. D. Wall, *M. M. & C. B* ... Montgomery, Ala.
Western Counties' Ry. 4–8½ g. 67 m. 8 lo. 137 cars
J. Brignell, *Supt* .... Yarmouth, N. S.
Western Maryland R. R. 4–8½ g. 157 m. 25 lo. 439 c
J. M. Hood, *Pr. & Gen. Man* .... Baltimore, Md.
R. J. Adair, *Pur. Agt* .... Baltimore, Md.
David Holtz, *Mast. of Mach.* Union Bridge, Md.
J. H. Nussear, *M. C. B* .... Union Bridge, Md.
Western No. Carolina R. R. 5 g. 210 m. 17 lo. 160 c.
V. E. McBee, *Supt* .... Salisbury, N. C.
Jos. P. Minetree, *Pur. Agt* ...... Richmond, Va.
G. W. Gates, *M. M* .... Salisbury, N. C.
Western & Atlantic R. R. 5 g. 138 m. 58 lo. 952 c.
R. A. Anderson, *Gen. Supt* .... Atlanta, Ga.
A. B. Bostwick, *Asst. Supt* .... Atlanta, Ga.
John H. Flynn, *M. M. & C. B* .... Atlanta, Ga
Wheeling, Pittsburg & Baltimore R. R. (*See B. & O.*)
Wheeling & Lake Erie R. R. 267 m. 31 lo. 1,456 c.
M. D. Woodford, *Gen. Man* .... Toledo, O
O. P. Dunbar, *Gen. M. M* .... Norwalk, O.
John Hillhouse, *Div. M. M* .... Norwalk, O.
Cleve. & Mar. Div.:
A. Galloway, *Div. M. M* ...... Cambridge, O
Whitby, Port Perry & Lindsay Ry. (*See Mid. of Can.*)
White Water R. R. (*See Ft. W., Cin. & Lou.*)
Whitefield & Jefferson R. R. (*See Bos., Con. & Mon.*)
Whitneyville & Machiasport R. R. 8 m. 2 lo. 48 c.
C. Sullivan, *G. M. & Pur. Agt.* Whitneyville, Me.
Wicomico & Pocomoke R. R. 4-8½ g. 30 m. 2 lo. 38 c.
L. Showell, *Pres* .... Berlin, Md.
Williamsport & North Branch R. R. 4–8½ g. 9 m. 2 lo. 4 cars.
B. G. Welch, *Man. & P. Agt* .. Hughesville, Pa.
J. V. Chamberlain, *Supt. & M. M.* do.
Williamstown & Del. River R. R. 4–8½ g. 9 m. 1 lo. 10 cars.
Samuel Garwood, *Supt* .. Williamstown, N. J.
Wilmington, Columbia & Augusta R. R. (*See W. & W.*)
Wilmington & No'n R. R. 4–8¾ g. 85 m. 16 lo. 148 c.
J. H. Thompson, *Supt. & P. A.* Coatesville, Pa.
George Rommel, *M. M* .... Coatesville, Pa
Alex. Maitland, *M. C. B* .... Coatesville, Pa.
Wilmington & Weldon; Northeastern; S. C. Central; Cheraw & Darlington; Cheraw & Salisbury; and Wilmington, Columbia & Augusta R. Rs. 5 g. 599 miles 70 locomotives 1,120 cars.
R. R. Bridgers, *Gen. Man* .... Wilmington, N. C.
J. F. Divine, *Gen. Supt* .... Wilmington, N. C.
John Bisset, *M. M* .... Wilmington, N. C.
W. H. Day, *M. C. B* .... Florence, S. C.
J. H. Davis, *M. C. B.* (W. & W.) Wilmington, N. C.
Winifrede R. R. 4–9 g. 5 m. 1 lo. 65 cars.
Theodore Wright, *Pres* .... Philadelphia, Pa.
Windsor & Annapolis Ry. 4–8½ g. 130 m. 10 lo. 160 c.
P. Innes, *Gen. Man* .... Kentville, N. S.
Wm. Yould, *M. M* .... Kentville, N. S.
Wm. Grierson, *M. C. B* .... Kentville, N. S.
Wisconsin Central R. R. 4-8½ g. 480 m. 59 lo. 1,800 c.
F. N. Finney, *Gen. Man* .... Milwaukee, Wis.
E. K. Howes, *Pur. Agt* .... Milwaukee, Wis.
W. A. Short, *Supt. M. P. & M* ... Stevens Pt., Wis.
Mil. & E'n Divs.: A. A. Allen, *S.* Milwaukee, Wis.
Wis., Minn. & S. M. & N. Div.:
W. E. Carroll, *Supt* .... Stevens Point, Wis.
Wisconsin, Iowa & Nebraska.
B. L. Harding, *Gen. Man* ...... Des Moines, Ia.
G. C. McMichael, *Supt* ...... Marshalltown, Ia.
M. C. Wheeler, *M. M* .... Marshalltown, Ia.
Wisconsin & Michigan R. R. (*See Mil. & North'n.*)
Wisconsin & Minnesota R. R. (*See Wis. Cen.*)
Wood River Branch R. R. 4–8½ g. 6 m. 2 lo. 3 cars.
L. M. Barber, *Supt* .... Hope Valley, R. I.
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Swinburne	39	16	22	4	4.10	59,000	36,000	Coal.	3,200.00
"	40	15	22	4	4.10	57,000	35,000	"	3,000.00
M. S. & N. I. Ry	53	15	20	4	4.10	58,000	35,000	"	3,500.00
" "	88	16	22	4	5.	60,000	16,000	"	3,000.00
Amoskeag	228	15	22	4	5.	57,000	35,000	"	2,700.00
N. J. L. Works	233	16	22	4	5.	60,000	35,000	"	3,200.00
Amoskeag	496	16½	22	4	5.	59,000	26,000	"	3,000.00
L. S. & M. S. Ry.	217	16	22	4	5.	58,000	36,000	"	3,500.00
Cuyahoga	226	16	22	4	5.	55,000	35,000	"	3,000.00
L. S. & M. S. Ry	227	16	22	4	5.	58,000	36,000	"	3,000.00
Manchester	229	16	22	4	5.	58,000	36,000	"	2,800.00
Cuyahoga	230	16	22	4	5.	57,000	36,000	"	3,200.00
L. S. & M. S. Ry	201	16	22	4	5.	58,000	36,000	"	3,000.00

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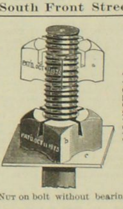

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a. ATWOOD NUT on bolt without bearing on base slots open.

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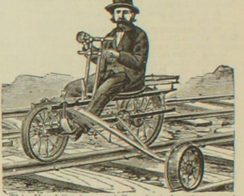

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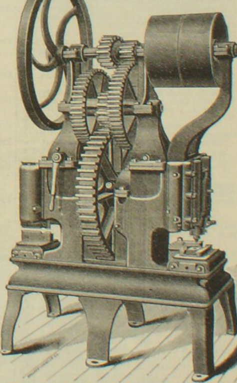

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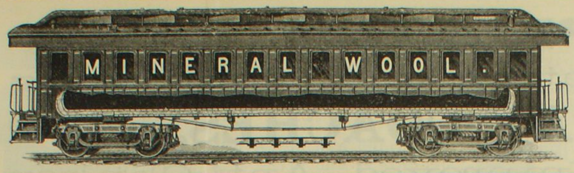
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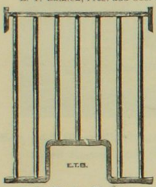

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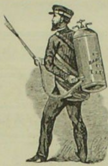

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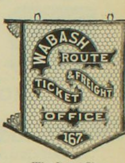

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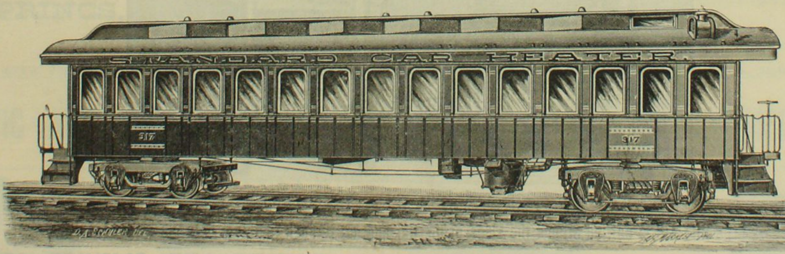

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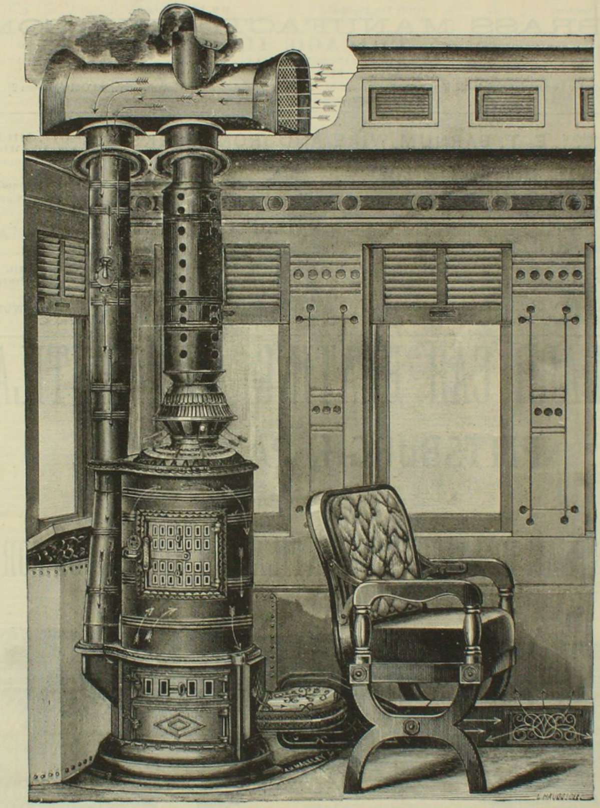

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The HOT AIR is carried around the sides of the Car and out through registers between each seat.

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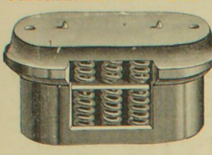

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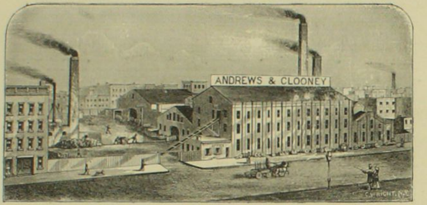

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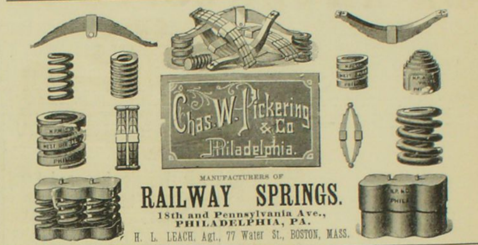

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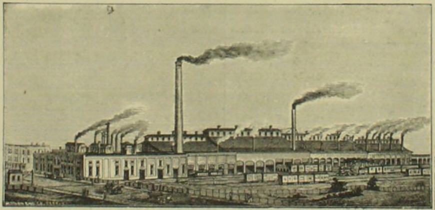

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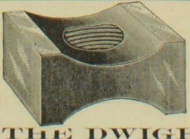

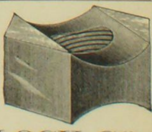

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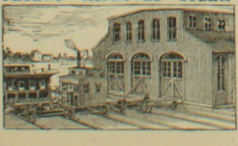

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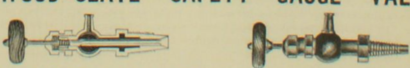

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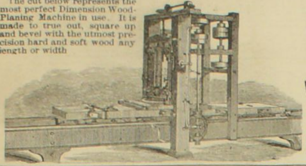

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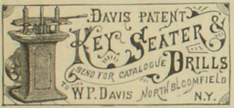

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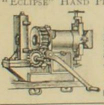

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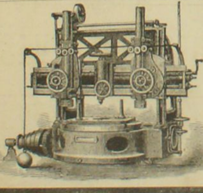

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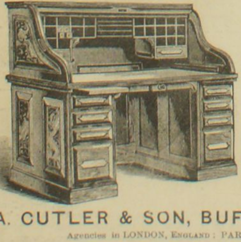

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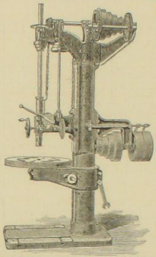

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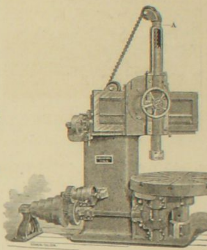

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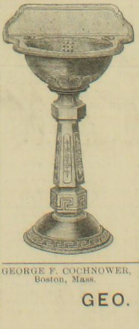

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